The Relationship Between Governance Practices, Audit Quality and Earnings Management: UK Evidence

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THE RELATIONSHIP BETWEEN GOVERNANCE PRACTICES, AUDIT QUALITY AND EARNINGS MANAGEMENT: UK EVIDENCE

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ABSTRACT

This thesis examines two empirical studies. Firstly, it examines the relationship between corporate governance characteristics (relating to the size, composition of independent members, financial expertise and meeting frequency of boards of directors and audit committee) and audit quality. Secondly, the study investigates the effectiveness of corporate governance characteristics and higher quality auditors in constraining earnings management. There are three proxies of audit quality employed: audit fees, non-audit fees and industry specialist auditors. Based on data obtained from the FTSE 350 between 2005 and 2008, the first empirical findings suggest that independent non-executive directors on board demand an additional and extensive audit effort from the auditor in order to certify their monitoring function, resulting in an increase in the audit fees and the perceived audit quality. The results also indicate a positive relationship between independent board and non-audit fees, suggesting that independent board support the view that the joint provision of audit and non-audit services does not necessarily compromise auditor independence, but rather that it broadens the auditors' knowledge and improves audit judgement. The findings from the second empirical study suggest that higher quality auditors (which either charge higher audit fees or are industry specialist auditors) are likely to reduce earnings manipulation. However, no evidence suggests that NAS fees affect earnings management. In addition, the current study finds inconsistent results linking the corporate governance characteristics and opportunistic earnings. Overall, both findings are consistent with agency theory, which states that independent board and higher quality auditors are associated with effective monitoring, which in turn helps to improve the quality of financial reporting. The findings are of potential interest to policy makers, professionals and boards of directors, especially on issues relating to audit quality and the mandating of corporate governance practices.

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ABBREVIATIONS

%	Percentage
2SLS	Two Stage Least Square
A&A	Arthur Andersen
ACCA	The Association of Chartered Certified Accountants
ACEXP	Audit committee expertise
ACIND	Audit committee independence
ACMEET	Audit committee meeting
ACQ	Number of acquisitions
ACSIZE	Audit committee size
Adj.	Adjusted
BDRNED	Board of directors composition
BLOCK	Institutional ownership
BRC	The Blue Ribbon Committee
BRDEXP	Board expertise
BRDMEET	Board meeting
BRDSIZE	Board size
CA	Current asset
Cash	Cash and cash equivalent
CEOs	Chief Executive Officers
CFO	Cash flow from operation scaled by lagged total asset
CL	Current liabilities
DACCJM	Discretionary accrual based on Jones model
DACCMJM	Discretionary accruals based on Modified Jones model
DACCROA	Performance-adjusted discretionary accruals
DEBT	Debt
DEP	Depreciation and amortization expenses
DL	Deloitte
e.g.	Exempli gratia (Latin: for instance)

et al.	et alia (Latin: and other)
EY	Ernst & Young
FEERATIO1	Fee ratio of NAS fees to total fees
FEERATIO2	Fee ratio of NAS fees to audit fees
FORGN	Foreign subsidiaries to total consolidated subsidiaries
FORGNSALE	Proportion of the firm' foreign sales
FTSE	Financial Times Stock Exchange
GAAP	General Accepted Accounting Principles
GLS	Generalize least square
GROWTH	Growth rate in sales
H_0	Hypothesis null
i	Company i
i.e.	id est (Latin: that is to say)
ICAEW	The Institute of Chartered Accountants of England and Wales
ICB	Industry Classification Benchmark
INOWN	Directors' ownership
KPMG	KPMG Peat Marwick
L&H	Laventhol and Horwath
LEVERG	Proportion of debts to total assets
LIQ	Ratio of current assets divided by current liabilities
LNAFEE	Natural log of audit fees
LNASSET	Natural logarithm of total assets
LNNAF	Natural log of NAS fees;
LNTOTALFEES	Natural log of the sum of audit and NAS fees
LOSS	Negative income
MTBV	Market to book value ratio
N	Sample size
NAS	Non-audit services
NEWDIR	New appointment of external director
NWFUND	Issuance of new shares or debt for cash

NWFUNDRATIO	Ratio of new debt and equity issuance to total assets
OLS	Ordinary least square
PWC	Price Waterhouse Coopers
RECINV	Proportion of total assets in account receivable and inventory
RESTR	Occurance of restructuring program
RETURN	Fiscal year total stock return
ROA	Return on assets
SEC	Securities Exchange
SOX	Sarbanes-Oxley Act of 2002
SPECLST_MS	Industry specialist auditors - market share
SPECLST_MS30	Industry specialist auditors - cut off 30%
SPECLST_MSLEADER	Industry specialist auditors - leader
SPECLST_PS	Industry specialist auditors - portfolio share
SPECLST_WEIGHTED	Industry specialist auditors - weighted average
SQSUBS	Consolidated subsidiaries
t	Period t or year-end of period t
TACC	Total accruals
UK	United Kingdom
US	United States
VIF	The Variance Inflation Factor

LIST OF APPENDICES

DECLARATION

I hereby declare that the materials contained in this thesis have not been previously submitted for a degree in this or any other university. I further declare that this thesis is solely base on my own research.

Rohaida Basiruddin

STATEMENT OF COPYRIGHT

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CHAPTER 1
INTRODUCTION

1.1 Background of study

The issues of audit quality, corporate governance and earnings management have received significant attention from government regulators, the auditing profession and the public, especially following the recent high-profile corporate scandals. The integrity of the financial reporting system is being questioned, the credibility of the auditor is in doubt and a firm's governance system is liable to be blamed because of the lack of auditor independence and oversight from the board. DeFond and Francis (2005) claim that the consequence of the corporate scandal has renewed the importance of independent audits and their linkage to the monitoring role of corporate governance.

Agency theory provides an explanation of why independent audit is important to the financial market. The independent audit helps to mitigate the agent-principal conflict by providing the assurance that financial statements are carefully prepared and free from material error (Wallace, 1980). It also reduces the likelihood of accounting fraud and illegal reporting practices (Wallace, 1980), such as earnings management, so that the market participant can use the financial reports without any hesitation. In addition, the auditor can improve the quality of financial reporting through their competency and willingness to report an accounting misstatement (DeAngelo, 1981) and to respond to aggressive earnings conservatism[1] (Ruddock et al., 2006). Furthermore, the regulators believe that good corporate governance is able to improve the ability of boards and their committees to manage effectively and in the best interest of shareholders, whose trust and confidence is gained through higher quality auditing (SOX, 2002; UK Corporate Governance Code, 2010).

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[1] Conservatism is defined as "the application of a higher standard of verification for favourable information" (Ruddock et al., 2006: 706). According to Ruddock et al. (2006: 740) "conservatism is an important attribute of financial reporting and is associated with the factors that underlie the demand for audit quality".

In most cases shareholders depend on the ability of a board and its committee to monitor the independence of both the management and the auditors.[2] Therefore, responsibility for the quality of financial reporting is laid on the effective board and its committee. Most prior studies have focused on the role of the audit committee as the main agent in ensuring the integrity of financial information and dealing with issues related to an external audit (Chen et al. 2005; Abbott and Parker 2000). However, given that the board of directors is responsible for appointing and removing the audit committee's members and the external auditors, their role is equally crucial in promoting a higher quality of financial reporting. The Blue Ribbon Committee (BRC, 1999: 6-7) reports that, "the performance of audit committees must be founded in the practices and attitudes of the entire board of directors ... If the board is dysfunctional, the audit committee likely will not be much better." Similarly, a few studies have indicated that the audit committee's effectiveness is associated with the composition of the entire board of directors (Menon and William, 1994; Collier and Gregory, 1999; Cohen et al., 2002; Boo and Sharma, 2008). Therefore, in this thesis, while the demand for a higher quality auditor is recognised, the monitoring roles of board and audit committee are argued to be the more important mechanisms by which to promote a higher quality of financial reporting.

Specifically, two empirical studies will be examined in this thesis: (1) the study of the relationships between the effective board of directors, the audit committee and audit quality and (2) the study of the relationships between the effective boards, the audit committee and auditor quality in respect of constraining earnings management. It has been argued that the firms with effective boards and audit committees constantly demand higher quality auditors because by employing higher quality auditors they add credibility to the financial reports, increase the firm's value and are able to safeguard themselves from damage to their reputations and legal exposure, all of which promotes the shareholders' interests (Carcello et al., 2002). When market participants lack the ability to directly observe the reported earnings, they may expect the managers of the firms in a strong monitoring environment to engage less in earnings manipulation. Therefore, the present study further argues that the firms with monitoring mechanisms that consist of the board of directors and an audit committee

[2] This referred to the minority shareholders.

with effective characteristics and a higher quality auditor have a greater ability to constrain opportunistic earnings, hence reducing uncertainty in the reported earnings.

1.2 Motivation for the study

This thesis is motivated by three major considerations. Firstly, studies of audit quality, earnings management and corporate governance continue to be important and to form a part of regulators' and policy makers' concerns. Levitt (1998; 2000) claims that the assessment of audit quality and earnings management is crucial because it is reflected the investors' confidence in the financial reporting and it affects the allocation of resources. A lack of investors' confidence in audit quality and reported earnings can seriously undermine the financial market, since investors are the largest group of users that provide capital support to the economic system. Despite the importance of audit quality, the boards of directors and its committees are recognised as monitoring mechanisms that may influence the quality of financial reports (Carcello et al., 2002; Abbott et al., 2004; Larcker and Richardson, 2004; Lin and Hwang, 2009). Therefore, how audit quality and the monitoring role of the board of directors and its committees affect the market's perception of reported earnings and audit quality remains important to the regulators and policy-makers.

Secondly, the non-audit services (hereafter NAS) continue to be controversial and are viewed with scepticism due to the potential that they may compromise auditor independence. In this thesis, NAS will be one of the proxies for audit quality. Prior studies consistently suggest that the policy-makers, users and investors perceive the NAS as impairing auditor independence (Panel on Audit Effectiveness, 2000; SEC, 2000; Beattie and Fearnley, 2002; Wines, 1994; Firth, 2002; Frankel et al. 2002; Raghunandan, 2003; Sharma and Sidhu, 2001; Larcker and Richadson, 2004). For example, in US, the Sarbanes-Oxley Act of 2002 (hereafter SOX) banned the auditor from providing several services related to NAS.[3] Consistent with SOX legislation, the

[3] The Sarbanes-Oxley Act of 2002 was enacted on July 30th, 2002, applies to US public companies (boards and management) and public accounting firms and has the objective of protecting investors by improving the accuracy and reliability of corporate disclosures that are made pursuant to the securities laws. **Sarbanes-Oxley Act of 2002: Title II – Auditor Independence: *Section 201: Services Outside the Scope of Practice of Auditors.*** The public accounting firms are prohibited from performing the following NAS for the financial statement audit clients: (1) bookkeeping or other services related to the accounting records or financial statements of the audit client; (2) financial information systems design and implementation; (3) appraisal or valuation services, fairness opinions, or contribution-in-kind reports; (4) actuarial services; (5) internal audit outsourcing services; (6) management functions or

UK regulator also responds to NAS by issuing the Ethical Standard (ES) for auditors. For instance, the ES 5 requires auditors to assess possible threats that may impair their objectivity and independence, and to identify effective safeguards to reduce these potential threats. In addition, ES 5 has also banned several NAS services that were believed to have compromised auditors' objectivity and independence.[4] In summary, both regulatory agents claim that the higher provisions of NAS can impair auditor independence. Despite the negative effect of NAS on auditor independence, several studies argue that the joint provision of audit and NAS may also broaden the auditor's knowledge and improve the audit judgement. This, in turn, enhances the quality of financial reporting (see Simunic, 1984; Beck et al., 1988a; Arruñada, 1999a; 1999b; 2000; Wallman, 1996; Goldman and Barlev, 1974). Such mixed arguments motivate the present study to examine the levels of NAS fees and their relation to corporate governance and earnings management.

Furthermore, DeFond and Francis (2005) call for research on NAS studies to incorporate fees dependency as an alternative measure of auditor independence. They claim that, during the drafting of the SOX legislation, the study carried out by Frankel et al. (2002) has been used to generalize the implication of higher levels of NAS fees, and that subsequent studies in NAS fees have claimed that Frankel's research was sensitive to the research design, sample selection and model specification.[5] They further argue that the SEC had never raised the issues of fee dependency when they proposed to ban NAS in 2000. Hence, DeFond and Francis (2005) call for research of NAS studies to take into account the total fees (the sum of audit and NAS fees) as an alternative measure of the financial dependencies that are believed to affect the auditor's objectivity. As far as the present study is concerned, no studies in the UK have employed the total amount of auditor fees in examining the relationships between corporate governance and NAS, and between the corporate governance and NAS in constraining earnings management. Therefore, the total fees will be one of the NAS measures to fill the gap in the UK literature. In fact, there are three other

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human resources; (7) broker or dealer, investment adviser, or investment banking services; (8) legal services and expert services unrelated to the audit; and (9) any other service that the Board determines, by regulation, is impermissible.

[4] The prohibitions are set out in Appendix 1.

[5] Frankel et al. (2002) suggest that the firms that paid higher NAS fees are likely to have higher abnormal accruals, indicating the managerial discretion in managing earnings.

measures that will be employed in this thesis (i.e. the level of NAS fees compared to the sum of audit and NAS fees, the ratio of NAS fees to total fees and the ratio of NAS fees to audit fees) in order to ensure that the results are robust to several measures of auditor independence.

Thirdly, most of the prior studies relating to audit quality, corporate governance and earnings management have been conducted in the US. This offers different institutional settings from the UK market and thus limits the generality of their findings for contexts beyond the US. Although the UK and the US share some common features, there are differences in corporate governance systems (e.g. Toms and Wright, 2005). In the UK, share ownership is less dispersed than in the US and the nature of investor activism differs and is shaped by the different rights of shareholders in the two countries (Kirchmaier et al., 2005). As noted by Aguilera et al. (2006), British institutional investors (mainly pension funds and insurance companies) tend to be more dominant than their American counterparts (mainly mutual funds). Also, major differences exist regarding the preparation of financial statements and the US disclosure system is more demanding. The US firms are required to disclose more detailed information about audit committees and auditors than are the UK firms (Lennox, 2003). Another area of divergence is the constraints on the exercise of board leadership (Aguilera et al. 2006). Most of the UK listed firms separate the role of the Chairman and the Chief Executive Officer (CEO), while most of the American CEOs are also the Chairman of the Board (Higgs Report, 2003). Also, CEOs' pay and stock-based incentives in the US are relatively higher than in the UK (Conyon and Murpht, 2000).

The UK adopts a voluntary corporate governance system that operates on a 'comply or explain' basis. The system is based on a set of good corporate governance practices to which listed firms are expected to adhere or, where they do not, they are expected to provide an explanation for their non-compliance in their annual report.[6] This is different from the mandatory corporate governance regime adopted in the US under

[6] The UK Corporate Governance Code (formerly the Combined Code) was issued in 1998 and has been revised since then. The fundamental changes in the Code were made in 2003 based on the recommendations set out in the Higgs Report (which reviewed the role and effectiveness of non-executive directors) and the Smith Report (which provided guidance on audit committees' functioning).

SOX. Indeed, the voluntary corporate governance system in the UK is one of the most comprehensive and it offers more specific guidelines on the formation of a board and its committee when compared with other countries that adopt a similar approach (Sharma et al., 2009). The voluntary formation allows the firms to choose the optimal structure of governance system to fit their needs. This could be different in the US where the firms are forced to follow the SOX requirements without any consideration of how they might prioritise their needs and raise concerns over the cost-benefit of SOX on smaller firms.

Furthermore, the litigation environment in the UK differs from that in the US market and other regimes and, therefore, it has a different effect on an auditor's reputation and performance (Khurana and Raman, 2004). When auditors' reputations are less likely to be affected by the regulator or by litigation, there is also less incentive for them to perform high-quality audits (Francis, 2006; Khurana and Raman, 2004).[7] Therefore, in the UK, the current study expects to find it highly desirable that, in their monitoring roles, the board and its committee ensure the quality of an auditor' work is not jeopardised by the lower litigation environment.

In summary, given that the US market offers different institutional settings, governance structures and litigation environments from those in the UK, the generalizability of American findings is limited. For these reasons, the present study examines the association between governance practices, audit quality and earnings management in the UK.

1.3 Contributions to knowledge

This thesis represents a comprehensive study on audit quality, corporate governance and earnings management, particularly in the UK market. Using the current data of FTSE 350 firms for the fiscal years of 2005 to 2008, the first part of this thesis examines the relationship between corporate governance and audit quality. The second part provides evidence linking audit quality, corporate governance and

[7] Khurana and Raman examine the relationship between cost of capital, litigation risk and financial reporting quality in the US and conclude that firms employing the big-4 auditors quantitatively have lower cost of capital than those with non-big 4 auditors but not in Australia, Canada and the UK due to lower litigation environment in these countries. They conclude that rather than brand name, the litigation risk drives the audit quality differences.

earnings management. Audit quality is measured using several proxies such as audit fees, NAS fees and industry specialist auditors. Corporate governance mechanisms are associated with the effective characteristics of the board and audit committee and they include committee size, composition of independent members, financial expertise and frequency of committee meetings.

Several contributions to knowledge are made through this thesis. Firstly, it contributes to debates on the importance of audit quality and corporate governance issues subsequent to the recent audit failure scandals. The findings from the first empirical investigation suggest that independent non-executive directors on board demand an additional and extensive audit effort to certify their monitoring function, resulting in an increase in the audit fees and the perceived audit quality. The second empirical finding suggests that the higher auditor fees and industry specialise auditor are associated with reduced earnings manipulations. Together, both documented findings support the proposition of agency theory and the regulatory concern that an effective board of directors and higher quality auditors are associated with effective monitoring and improved quality of financial reporting.

Secondly, this thesis contributes to the growing literature on studies of audit quality, corporate governance and earnings management. As stated in the motivations for the study, prior research in these areas has predominantly been undertaken in the US, which offers a different litigation environment, institutional setting, governance structure and auditor incentive, thus limits the generalizability of the findings to other countries. In particular, the current study expands the prior literature in six areas:

(1) To the best of the author's knowledge, no studies have examined the relationship between the industry specialist auditor as proxy for audit quality and the effective characteristics of the board and audit committee in the UK. Previous studies in this area were carried out by Abbott and Parker (2000), Beasley and Petroni (2001) and Chen et al. (2005) using US and Australian samples. The investigation of UK firms expands the existing literature by providing evidence from voluntary governance practice and different institutional settings and litigation environments, each of which, it is argued, drive quality differences in the audit market.

(2) None of the prior studies on how the auditor industry specialist affects corporate governance and earnings management has used the complementary approach to calculate the effect of the auditor industry specialist. Most of these studies utilized the market share and portfolio approach (Abbott and Parker, 2000; Beasley and Petroni, 2001; Chen et al., 2005; Krishnan, 2003a; Balsam et al., 2003). According to Neal and Riley (2004) a complementary approach captures the complementary effect of both the market share and the portfolio approach and offers a solution for inconsistencies between these two main approaches.

(3) Previous UK studies that examine the relationship between corporate governance and auditor fees (audit fees and NAS fees) have been undertaken by Collier and Gregory (1996), O'Sullivan (1999; 2000), O'Sullivan and Diacon (2002), Adelopo (2010) and Zaman et al. (2011). Specifically, Collier and Gregory investigate the effect of the establishment of an audit committee on audit fees, using the 1991 data, while O'Sullivan examines the establishment of an audit committee and the effect of the composition of independent members on board and audit committee on audit fees, using data from 1992 and 1995. Recently, Adelopo (2010) examines more comprehensive corporate governance characteristics using single and simultaneous equations of audit and NAS fees on data from 2005 and 2006. Zaman et al. (20011) investigate the influence of audit committee effectiveness and several board characteristics (independent board, meetings frequency and duality role) on audit fees and non-audit fees using data 2001 to 2004. However, all of these studies do not consider financial expertise of the board of director. Previous US studies suggest that the boards of directors that are financially literate improve the quality of financial reporting (Xie et al., 2003; Agrawal and Chadha, 2005; Lee, 2008). By examining the effect of the financial expertise of the board of directors on audit fees and NAS fees, this thesis extends prior research on the effect of financial literacy of board members on the auditor remuneration in the UK market.

(4) In relation to the studies examining the effect of corporate governance and auditor quality on constraining earnings management in the UK, prior studies have been undertaken by Ferguson et al. (2004), Peasnell et al. (2000; 2005), Antle et al. (2006), Kwon et al. (2007), Habbash et al. (2010), Sun et al. (2010) and Habbash (2010). Ferguson et al. investigate the NAS fees, the big-5 auditors and several board characteristics (e.g. non-executive directors on board and CEO duality roles) on earnings management using the data from 1996 to 1998, while Peasnell et al. examine the board of director characteristics (e.g. board size, non-executive directors on board, CEO duality), the establishment of audit committee and the big-5 auditors using the data in the period between 1991 and 1996. Antle et al. (2006) look at the joint determination of audit fees, NAS fees and discretionary accruals using data from 1994 to 2000, while Kwon et al. (2007) investigate how a country's legal system affects the industry specialist auditor in constraining earnings management in 28 countries including the UK. Habbash et al. (2010) investigate the commitment of independent directors (i.e. composition, meetings and directors fees) and number of board meeting , while Sun et al. (2010) only control the size of boards and audit committee meetings in their earnings management model. All of these studies exclude the financial expertise of board and most of audit committee characteristics (e.g. size, composition, financial expertise and meeting frequency) in examining the effect of corporate governance on earnings management. Recently, Habbash (2010) examines the corporate governance characteristics (board and audit committee characteristics) and auditor quality variables separately using two different earnings management models. In his first model, he examines only the board of director characteristics, while in second model he investigates the audit committee attributes and auditor variables. The current study fills the gap between all these studies by examining the characteristics of board, audit committee and auditor quality variables on the single earnings management model. Larcker and Richardson (2004) claim that when a firm's corporate governance and auditor quality are isolated from one and another, it may result in an incomplete analysis of earnings management because the monitoring role of auditors varies depending on the strength of the firm's corporate governance.

(5) In this thesis, audit quality is measured using several proxies: audit fees, NAS fees and industry specialist auditors. Even each proxy is measured using several approaches. For example, the NAS fees proxy consists of the natural log of NAS fees, the natural log of total fees (sum of audit and NAS fees), the ratio of NAS fees to total fees and the ratio of NAS fees to audit fees. While the industry specialist auditor is measured in five ways, three measures are continuous variables (equal to the respective auditor's market share and the auditor's portfolio share, and complimentary between the market share and the portfolio share) and two measures are dichotomous variables (the industry leader and the auditor's market share at a 30 percent cut-off point in each particular industry). By examining multiple proxies of audit quality and several measures for each proxy, the current thesis provides an analysis of the impact of corporate governance characteristics and earnings management that is more comprehensive than prior studies that mostly examined only a single proxy of audit quality.

(6) The present study contributes to the methodology literature by considering the analysis using several estimations including the OLS regression, the robust regression, the least square regression with robust standard error, the quantile regression, the probit regression and the heteroskedastic ordinal regression. Several estimators are employed to ensure the efficiency of the data analysis since the OLS regression may not be an efficient estimator when some of the assumptions are not fulfilled. In addition, none of the prior research in corporate governance and audit quality employs the heteroskedastic ordinal regression that argues to increase the efficiency of logit/ probit regression in the presence of heterscedasticity. Further, all the analyses take into account endogeneity issues that have been neglected in a few previous studies.

Lastly, this thesis contributes to the debate on the joint provision of audit and NAS. The result from the NAS model suggests that the firms with a higher provision of independent directors on the board are likely to be associated with higher NAS fees. This suggests that an independent board may support the higher provision of NAS that is likely to improve the quality of audits due to the presence of knowledge spillover effects. Furthermore, no evidence suggests that the NAS is associated with opportunistic earnings. This finding contradicts the regulatory concern that the provisions of NAS compromise auditor independence and, thereby, reduce the quality of financial reporting.

1.4 Structure of research

This thesis is structured into seven chapters. This chapter discusses the background of the study, the motivation and the contribution that it makes.

Chapter 2 focuses on the theoretical framework underpinning this study. The main discussion centres on agency theory as the primary theory, which suggests that the monitoring roles of the board of directors and the audit committee, as well as the demand for independent audits, help to mitigate the agency conflict. The importance of independent audit and different levels of audit quality for the firms and market participants is explained through several hypotheses such as: the monitoring hypothesis, the information hypothesis, the signalling hypothesis and the insurance hypothesis. The relevant explanations as to why the board of directors and its committee and the auditor demand different levels of audit quality and limit opportunistic earnings are also highlighted.

Chapter 3 reviews the prior studies related to the three groups of subjects: audit quality, corporate governance and earnings management. Under the audit quality reviews, the current study defines audit quality and its possible measures. The effective characteristics of a board of directors and audit committee, including the size of the committee, the composition of independent members, the financial expertise of members and the frequency of meetings are also reviewed and discussed based on the propositions of agency theory and on prior documented evidence. The reviews on earnings management take into account the definition of earnings management, the motivation of opportunistic earnings and the measurement of earnings. Previous studies that are related to the association between audit quality and corporate governance and between the effects of corporate governance and auditor quality on constraining earnings management are also discussed. The end of the chapter follows the development of the hypotheses by previous authors.

Chapter 4 explains the methodology employed in this study. It explains and justifies the sample firm selection, the period of the study, the definitions and the measurements of the main variables, hypothesis variables, model specification and related control variables. The description of the source of data, the data collection procedures and analysis procedures are also discussed.

Chapter 5 and 6 present the results of the empirical findings on the associations between corporate governance and audit quality, and the relationship between corporate governance, audit quality and earnings management, respectively.

Finally, chapter 7 provides an overall summary and concludes the study. The implications, limitations and the recommendations for future research are discussed in this final chapter.

CHAPTER 2
THEORETICAL FRAMEWORK

2.1 Introduction

This chapter provides the theoretical framework for the present study. The main discussion is on the agency theory that highlights the relationship between principals and agents and the conflict that arises between them because of the different goals. As part to reduce the agency conflict, the monitoring role of board of directors and audit committee as well as the external audit are demanded. Several hypotheses related to the demand for audit and different levels of audit quality are also discussed in this chapter. The association between board of directors, audit committees, external auditors and financial reporting are highlighted. Finally, the summary and conclusion are presented in last section.

2.2 Definition of corporate governance

So far, existing studies have indicated that there is no specific acceptable definition for corporate governance (e.g. Solomon, 2007). However, several definitions of corporate governance have been discussed in prior studies (e.g. the Cadbury Report, 1992; Donaldson and Preston, 1995; Shleifer and Vishny, 1997; Turnbull, 1997). For example, the Cadbury Report (1992: 15) defines corporate governance as "a system by which companies are directed and controlled." This definition highlights the roles of the main players in an organisation that is comprised of shareholders, a board of directors and the auditor. As cited in the Cadbury Report (1992), the shareholders are responsible for appointing directors and auditors and for ensuring that the appropriate governance system is in place. The directors' function is associated with how the firm is governed, while the auditors' main role is to provide an independent check on financial statements to shareholders.

Shleifer and Vishny (1997: 737) describe corporate governance as "dealing with the ways in which suppliers of finance to corporations assure themselves of getting return on their investment". They suggest that legal protection of investor rights and concentrated ownership helps to control management discretion so that financiers are able to get returns on their investments.

Consistent with the Cadbury Report (1992), that stresses how firms are directed and controlled, Denis (2001: 192) states that corporate governance "encompasses the set of institutional and market mechanisms that induce self-interested managers (the controllers) to maximize the value of the residual cash flows of the firm on behalf of its shareholders (the owners)". Alternatively, Solomon (2007: 14) considers stakeholder concerns in the definition of corporate governance which is perceived as a "system of checks and balances, both internal and external to companies, which ensures that companies discharge their accountability to all their stakeholders and act in a socially responsible way in all areas of their business activity."

These various definitions and explanations of corporate governance exist because the authors view corporate governance from different perspectives and through different theoretical frameworks. For example, the definitions of corporate governance that are outlined by Cadbury (1992), Shleifer and Vishny (1997) and Denis (2001) seem to agree that corporate governance is associated with ownership and control and that it is aimed at maximising the shareholders' wealth. These definitions are influenced by agency theory. On the other hand, Solomon's definition is consistent with stakeholder theory which believes that in addition to maximising the shareholders' wealth, social and environmental issues are of significant importance to the firm. Stakeholder theory acknowledges that individuals, both inside and outside a firm, such as employees, suppliers, customers, publics, governments or other individuals or groups may have an effect on or be affected by the actions of that firm. These groups of individuals are referred as stakeholders (Freeman, 1984). The firms are responsible to carry out the actions that not only benefit them, but that benefit society as a whole.

Given that the current study examines the effect of the roles of the board of directors, the audit committee and the external audit on financial reporting quality (i.e. earnings management and audit quality), for the purposes of the study, corporate governance is viewed as a monitoring system of checks and balances to ensure that the interests of shareholders are safeguarded. Such a view can be expressed appropriately in agency theory. In addition, the focus of the current study is related to the quality of financial statements rather than on a firm's impact on social and environmental factors, therefore, stakeholder theory seems to deviate from the aim of the study.

2.3 Agency theory and information asymmetries

The proposition of agency theory has been addressed by Jensen and Meckling (1976) by the introduction of the concept of agency cost. They apply the concept of agency cost to explain issues associated with the separation of ownership and control in a large corporation, consistent with Berle and Means' (1932) propositions.

The ultimate element in agency theory is the conflict of interest between principals and agents. A principal (shareholder) assigns the power of the decision maker to an agent (manager) who, as an agent, executes their duties on behalf of the principal (Jensen and Meckling, 1976). Conflicts and dissimilar interests lead to information asymmetries between the two parties. The existence of information asymmetries results in two major agency problems, namely, moral hazard and adverse selection problems.

Moral hazard problems are associated with the problem of hidden actions when agents have the incentive to pursue self-interested behaviour. They arise when principals are unable to observe actions that are undertaken by the agents. Formally, an agent is expected to maximize the principal's wealth through their actions and decisions. However, agents tend to pursue their own interests. By contrast, adverse selection problems are associated with hidden information, where the agent has more information than the principal. Both problems may create, for example, the phenomenon of earnings management that, in turn, may cause shareholders, investors and debt holders to be unable to distinguish the true economic value of a firm.[8]

According to agency theory, since the managers or agents are inspired by extrinsic motivations (Sundaramurthy and Lewis, 2003), the principals have to identify ways to motivate the agents and to ensure that they act in the best interest of the principals. Jensen and Meckling (1976) suggest that agency cost can be an alternative way to reduce agency conflict and they define agency cost as consisting of monitoring cost, bonding cost and residual loss. Monitoring costs are the costs that are associated with the appointment of appropriate agents, such as external auditors, and with mechanisms that control the agents' behaviour, such as the roles played by the board

[8] Earning management is defined as "in the sense of purposeful intervention in the external financial reporting process, with the intent of obtaining some private gain" (Schipper, 1989: 92).

of directors. Bonding cost is the cost that is associated with contracting in order to ensure that agents always make decisions that support the principal's wealth. These costs include those that are related to the agent's compensation system. Residual loss is the agency loss that is associated with the imbalance between monitoring and bonding costs or, in other words, it is the reduction in principals' welfare that arises from an imperfect alignment of interest between agents and principals (Jensen and Meckling, 1976).

In this thesis, the monitoring roles of board and auditor are studied as mechanisms that mitigate agency conflicts. The board of directors acts on behalf of the shareholders and represents the shareholders' interests through overseeing managerial functions. Zahra and Pearce (1989) suggest that agency theory is the most comprehensive theory that clarifies the board of directors' functions and that highlights the importance of their controlling role. Consistent with this notion, Hung (1998) also claims that agency theory is a convincing theory for explaining the boards' monitoring role.

Alongside the monitoring role of a board of directors, Solomon (2007: 137) claims that the external audit represents another crucial element of a firm's internal control system and that it provides a check and balance system that helps shareholders to monitor and control the managements' activities. As pointed out by the Cadbury Report (1992: 36),

> "The annual audit is one of the cornerstones of corporate governance. Given the separation of ownership from management, the directors are required to report on their stewardship by means of the annual report and financial statements sent to the shareholders. The audit provides an external and objective check on the way in which the financial statements have been prepared and presented, and it is an essential part of the checks and balances required."

Therefore, it can be argued that agency theory is essential to the present study since it recognizes the monitoring roles of board of director and an external audit as mechanisms to control management behaviours. The following sections explain the characteristics of board and audit committee that contribute to the effectiveness of their monitoring function and the role of an external audit.

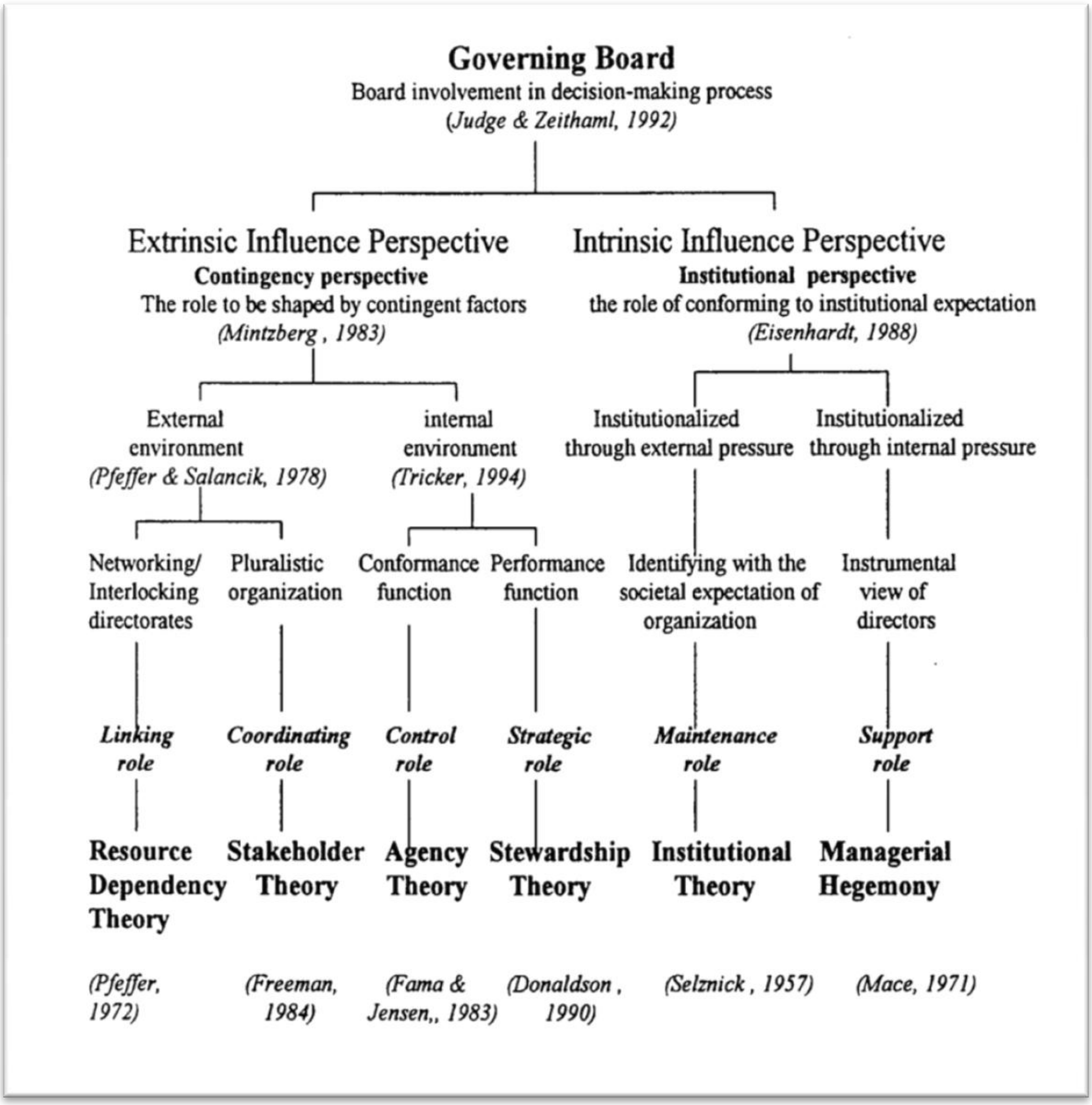

Figure 2.1: A typology of the theories relating to the roles of governing boards (Source: Hung, 1998)

2.2.1 The monitoring role of board of directors and audit committee

Fama and Jensen (1983) suggest that boards of directors are the primary decision makers in an organisation and that they have the power to compensate entire decisions that are made by the top management. Fama and Jensen also propose that, in the decision making process, the initiation and implementation should be separated from the ratification and monitoring of decisions in order to ensure that monitoring functions are more efficient.[9]

[9] The "initiation and implementation" of decisions are known as *decision management*, while "ratification and monitoring" are known as *decision control* (Jensen and Meckling, 1983: 304).

In other words, agency theory suggests that, in order to ensure that effective monitoring functions are in place, board of director members should include a representative from outsider members (hereafter non-executive directors) who is independent from management.[10] Vance (1983: 46) adds that the independent non-executive directors provide unbiased assessment that is “stockholder-oriented” and that establishes a best practice of “check and balance” on management's actions. The non-executive directors are also important because they possess significant knowledge (e.g. “capital market, technology, corporate law”) that enables them to complement insider information and act as arbitrators in any conflict that may arise between the insiders (Fama and Jensen, 1983: 314). In summary, the independent non-executive directors are better at monitoring management, due to their ‘independent’ and ‘complimentary knowledge’ characteristics.

The proposition of independent non-executive directors in agency theory is contradictory to the principal of stewardship theory. Stewardship theory suggests that the manager is acting as a steward and that their endeavours promote their principals’ interest (Donaldson and Davis, 1991; Davis et al., 1997). The managers are inspired by non-financial motivations and intrinsic gratification resulting from hard work and a challenging working environment (Donaldson and Davis, 1991). As stated by Donaldson and Davis (1991: 51), the manager, “far from being an opportunistic shirker essentially wants to do a good job, to be a good steward of the corporate assets”. In order to maximize the potential of the managers, the appropriate approach is to establish an empowering structure (Donaldson and Davis, 1991). Managers are supposed to be given clear instructions and a higher position in the organisation's hierarchy where they would have autonomy and authority to make decisions and they would be enabled to use their full capacity in achieving the organisation’s objectives. From a shareholder's point of view, the dominant insiders (hereafter known as executive directors) on boards are preferred to non-executive directors. This is because they have greater knowledge and awareness of current operations and they

[10] Specifically, the outsider directors, however, can be distinguished between those who are independent from management and have no relationship that would effect the exercising of their judgments and decision making in the organization and those who are not (Lawrence and Stapledon, 1999). The non-executive director who is related to management is also been known as gray or affiliated non-executive director. The independent non-executive director is believed to have better monitoring position than gray or affiliated non-executive director (Lawrence and Stapledon, 1999)

have more technical expertise and, hence, they assume a more responsible attitude towards the organisation (Muth and Donaldson, 1998). Therefore, the shareholders could expect more return from them than from non-executive directors who are assumed to be less informed about the organisation and to have a self-serving attitude.

Although stewardship theory identifies that executive directors are more beneficial than non-executive directors, the present study believes that the monitoring role of a board of directors as described by agency theory is more relevant to explaining variations in audit quality and earnings management. Agency theory recognises the independence of non-executive directors as a monitoring mechanism which is vital to the promotion of high quality audits and higher quality financial reporting. Hung (1998) suggests that the executive's task is focus on a 'strategic role' rather than a 'monitoring role'. In real systems, the agents or stewards are intent on pursuing their own interests instead of the interests of others.

As well as having an independent non-executive director on a board and in an audit committee, empirical evidence also suggests that the size of a committee, specific knowledge, experience and a greater frequency of meetings may strengthen a board and audit committee's monitoring functions (e.g. Lipton and Lorsch, 1992; Yermark 1996; Chen and Zhou 2007; Monks and Minow 2008; Dezoort 1998; Carcello et al. 2002; Abbott et al. 2003a, Krishnan and Lee 2009; Menon and Williams 1994; Vafeas 1999; Abbott et al. 2004; Ronen and Yaari 2008). Zahra and Pearce (1989: 308-310) claim that the efficiency of a board of director's function is dependent on the (1) size of board and the type of membership, (2) the attributes of the directors, such as their competence and skills, (3) the establishment of the appropriate committees and (4) the board of director's meeting (e.g. communication between directors, agenda and documentation). Walker (2004: 158) also notes that "the performance of audit committees necessarily depends on the people involved, their knowledge, skills, critical capacities, skepticism and determination". The empirical evidence for each of these characteristics will be discussed later in Chapter 3.

2.2.2 The role of external audit

Audit functions have been observed to exist since the 13th century to provide a form of assurance that the financial information provided by the management accurately represents the financial position of the firms (Watt and Zimmerman, 1983).[11] Consistent with agency theory, audit function is viewed as a mechanism to reduce uncertainty on the levels of information asymmetry between shareholders/investors and management. As shareholders and investors have limited access to internal information from within a firm, the independent audit reports on the truth and fairness of financial statements that are prepared by management. As outlined in the International Standard of Auditing, ISA (UK and Ireland) 200: *Overall Objective of the Independent Auditor and the Conduct of an Audit in Accordance International Standards on Auditing (UK and Ireland),* (ABP, 2009: 2-3):

> "The purpose of an audit is to enhance the degree of confidence of intended users in the financial statements. This is achieved by the expression of an opinion by the auditor on whether the financial statements are prepared, in all material respects, in accordance with an applicable financial reporting framework… As the basis for the auditor's opinion, ISAs (UK and Ireland) require the auditor to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error. Reasonable assurance is a high level of assurance."

Variations in the level of conflict and information asymmetry are assumed to differ from firm to firm and may demand different levels of auditing and of audit quality (DeAngelo, 1981; Watt and Zimmerman, 1986). The higher the agency cost, the larger the information asymmetries' gap and thus the higher the levels of audit quality will be demanded. The next section explains the relevant hypotheses in order to clarify why a firm's management, including the board of directors, audit committee, shareholders and investors, demands audit services and different levels of audit quality.

2.3 Demand for external audit and different levels of audit quality

Several hypotheses have been used in the prior literature to explain the demand for audit services and the different levels of audit quality. Each of these hypotheses is now reviewed. It is important to highlight that these hypotheses may appear to be

[11] The audit function exists as early in the development of business corporations since 1220, accomplished by the directors or shareholders of the companies. In between early and mid nineteenth century in UK and US, the audit then started been prepared by the professional auditors due to the increasing numbers of corporations and complexity of the accounts which required the skill and the expertise of professional auditors (Watts and Zimmerman, 1983).

related to one and another (e.g. Wallace, 1984; Willenborg, 1999; Menon and William; 1994).

2.3.1 Monitoring hypothesis

The monitoring hypothesis is based on the agency relationship. Agency theory suggests that agency cost is a potential solution to agent-principal conflicts and that one of the answers to the problem is provided by an independent audit (Jensen and Meckling, 1976). According to Wilson (1983), the monitoring role of audit minimizes the moral hazard and adverse selection problems that arise from the information asymmetries problem.[12] As cited in Wilson (1983), in the case of a moral hazard problem, the managers responsible for protecting a firm's assets may misuse the assets or fail to maintain them, in which case such actions are not directly observable by the owner and potential investors. In the case of an adverse selection problem, such assets have their own fixed values. The managers have more information about these values and they are able to manipulate information for their own personal gain. Consequently, owners need to adopt an effective way to monitor managers' opportunistic behaviour and the credibility of the information provided by managers as well as considering how to improve the investors' opportunities to observe such assets.[13] One possibility of achieving this is through independent audits. Auditors provide managers and potential investors with reliable verification and information on the value of assets. In other words, the independent audit provides an assurance to the owners and potential investors that the information provided by managers is reliable.

The independent audit can be generated by the principal (monitoring cost) or the agent (bonding cost). Humphrey (1997) argues that agents can demand an independent audit because principals normally tend to neglect monitoring activity as they are able to safeguard themselves from the risk of loss by paying lower wages to an agent (subject to the cost of an independent audit being less than the wage loss that an agent could suffer without an independent audit). The presumption is that principals will pay more

[12] The monitoring role also can be regarded as assurance role since Brown et al. (2008) suggest that the primary purpose of audit is to reduce the information asymmetries between managers and stakeholders which, consistent to Wilson (1983) that suggest the independent audit able to mitigate the moral hazard and adverse selection problems.

[13] The owners are able to improve the accuracy and the reliability of the information to the potential investors via the appointment of reputation auditors (Wilson, 1983).

to agents for work that has been verified by an independent audit than that which has not been so verified. As pointed out by Wallace (1980: 14), “the stewardship (monitoring) hypothesis states than when one party is delegated decision making power, he has an incentive to agree to be checked if the benefits from such monitoring activities exceed the related cost.”

According to Wallace (1980) an independent audit provides an assurance that the financial reports that are provided by the managements have been carefully prepared and they are free from material errors. Thus, the market participants including the potential investors can use the audited financial statements without any hesitation. Moreover, an independent audit also mitigates financial statement fraud and illegal reporting and improves the internal control and operational efficiency of a firm (Wallace, 1980; Chow 1982). For example, when managers know that their financial reports will be examined by auditors, fraud and illegal behaviour can be minimised indirectly because they are worried that such actions will be discovered by the auditors. In addition, when auditors perform an audit review or audit testing on the internal control system of a firm, they will discover if certain internal control procedures are missing or have not been performed properly. Thus, auditors typically provide recommendations to improve existing internal control systems. Such restrictions and recommendations are able to improve the effectiveness and efficiency of a firm’s operation. In summary, these observations suggest that audit services not only provide a monitoring tool for owners, managers and potential investors, but also for the whole organization including its employees and creditors.

2.3.2 Information hypothesis

As previously stated, the higher the agency conflicts, the larger the information asymmetries and thus the higher the quality of audit services that will be demanded. Wallace (1980) suggests that investors demand audited financial statements because the quality of financial information is improved through an independent audit. He further suggests that audited financial information is able to (1) reduce market-related (systematic) and firm-specific (unsystematic) risks, (2) improve decision making and (3) provide access to new information for investors. As cited in Wallace (1980: 16-17), a risk-averse investor may demand a higher rate of return for the higher levels of risk or pay a higher risk premium to reduce the levels of uncertainty or investment risk. It is assumed that the risk premium is associated with an individual investor's assessment of an audit service; through audit, uncertainty about the accuracy of financial information provided by management can be reduced (Shakun, 1978). If the sum of risk premium for each investor is mutually adjoined exceeds the cost of audit, the audited financial information is beneficial to all parties since all parties enjoy less uncertain information. According to Wallace (1980), some investors may also reduce their investment risk by developing a portfolio of both audited and unaudited investment opportunities. Any reduction in the risk premium that is linked to the audited information will be compensated through a specific firm’s audit cost. However, the unaudited investment portfolio may cause an increase in the variability of the market and thus the cost of audits could be balanced against the demand on the unverifiable market risk premium. Moreover, the barriers concerning to the portfolio diversification can create larger risk premium to offset the firm-specific risk of unaudited financial information. In summary, it is through audits that investors reduce both market-related risk and firm-specific risk (Wallace 1980; Shakun, 1978).

According to Wallace (1980), the monitoring hypothesis seems to overlap with the information hypothesis since the part of the audited information that is valuable to agents and principals is also applicable to investors for their investment decisions. However, he further suggests that the monitoring hypothesis provides support for the practice of furnishing principals with an audited financial statement only within the period of the contract agreement (i.e. within the duration of the agent-principal relationship). According to the information hypothesis, financial information determines market value. Investors require financial information in order to make a rational investment decision even though they are on the outside of a contract of agent and principal relationships. In other words, in order to make investment decisions, investors need financial information from firms on a continuous basis and without time limits

2.3.3 Signalling or reputation hypothesis

Wallace (1980: 30) notes that “signalling is a kind of implicit guarantee”. In an agency relationship in which information asymmetry problems arise, the suppliers of financial statements are assumed to be dishonest in reporting financial information. As such, the users of financial statements are incapable of distinguishing between honest and dishonest information. In this case, the demand for independent audits can be seen to result in the financial statement users receiving honest reports (Wallace, 1980). Thus, audit services inform the market that the financial statements that are provided by management are also free from material errors. Such assurance provides the confidence to investors and other users of a financial statement that the reported accounting numbers are reliable. As pointed out by Wallace (1980: 36), “specifically, an audit can signal less noise or error in the financial report, greater fineness in the reporting methods (including with GAAP), and unbiased performance measures.”

Furthermore, the signalling hypothesis offers an explanation for the demand for different levels of audit quality. According to Moizer (1992), in a market where sellers are unable to build a reputation, two major agency problems (moral hazard and adverse selection problems) collaborate to diminish the quality of the product. If buyers fail to make a distinction between the different levels of audit quality, they may view all audit services as being of average quality and will only be willing to pay for them at the same price. The audit providers do not, therefore, have any way of influencing a buyer to acquire their services in preference to any others. As a result, the moral hazard problem will arise because providers are likely to sell low quality and low cost services in order to maximise their profits and the profits that would come from providing good quality services are now accumulated among providers regardless of the quality of an individual provider (Moizer, 1992).

Simultaneously, the adverse selection problem could also arise because of the possibly that the market will become driven by low quality providers and good quality providers will be forced to desist from the market (Moizer, 1992). The consequence of these effect trades of average quality services is that the market becomes smaller, and this leads to the potential for market collapse (Akerlof, 1970). The signalling framework provides a cure for market collapse because it explains the sellers’ ability to provide a signal to uninformed buyers about the quality of their products or services where there is an assumption that the seller knows the quality of their product and the buyer does not (Bar-Yosef and Livnat, 1984).

Since buyers are unable to determine the quality of a product in advance, several models of reputation capital suggest that the seller needs to expend resources in order to establish a reputation (Klein and Leffler, 1981; Shapiro, 1983; Rogerson, 1983; Allen, 1984). For example, Klein and Leffler (1981) argue that higher quality sellers invest in non-salvageable firm-specific assets (e.g. advertising or marketing investment) in order to prevent their competitors from entering the market and thus they provide direct value to buyers. Shapiro (1983) suggests that sellers can establish their reputation by initially charging for a higher quality product at a minimum quality price that is equivalent to the cost of production because they are new entrants to the market. In the early period the sellers may suffer economic losses, but later they recover the price premium, provided that they maintain the production of higher quality products. As pointed out by Shapiro (1983: 669):

> "… the premium for a high quality product represents only a fair rate of return on the investment in reputation. The typical time pattern of profits to a seller is given by an initial period of losses, i.e., investment in reputation, followed by a stream of profits… The higher the quality produced, the larger are the initial losses (investment in reputation) and the subsequent profits (premiums for high quality items)."

Allen (1984) disagrees with the models proposed by Klein and Leffler (1981) and Shapiro (1983) by saying that investments in non-salvageable firm-specific assets are not practical in some industries and that sellers should probably not charge for a higher quality product at a minimum quality price and thus suffer losses in the initial period of investment. Allen (1984: 312) argues that sellers that produce a higher quality product should price it at a higher price which can be above the marginal cost. He claims that buyers "reassure themselves about high quality of each firm's output by verifying that the price charged and quantity produced are consistent with high quality's being more profitable than low quality". When a seller charges for a high quality product at lower cost, it is perceived by the buyer that the seller has transformed a higher quality product into a lower quality product, and this leads to the buyer's resistance to purchasing any of the seller's outputs.

Once the sellers' reputations have been established, they are then able to signal to the buyers that their products are endorsed with higher quality marks. Klein and Leffler (1981) suggest that firms with an established reputation are less likely to produce a low quality product because once the buyers are aware that they have purchased such a product, this information will quickly be disseminated to other buyers. Once their reputation is damaged, sellers may fail to secure an adequate return on their quality product (Klein and Leffler, 1981; Shapiro, 1982; 1983; Rogerson, 1983).

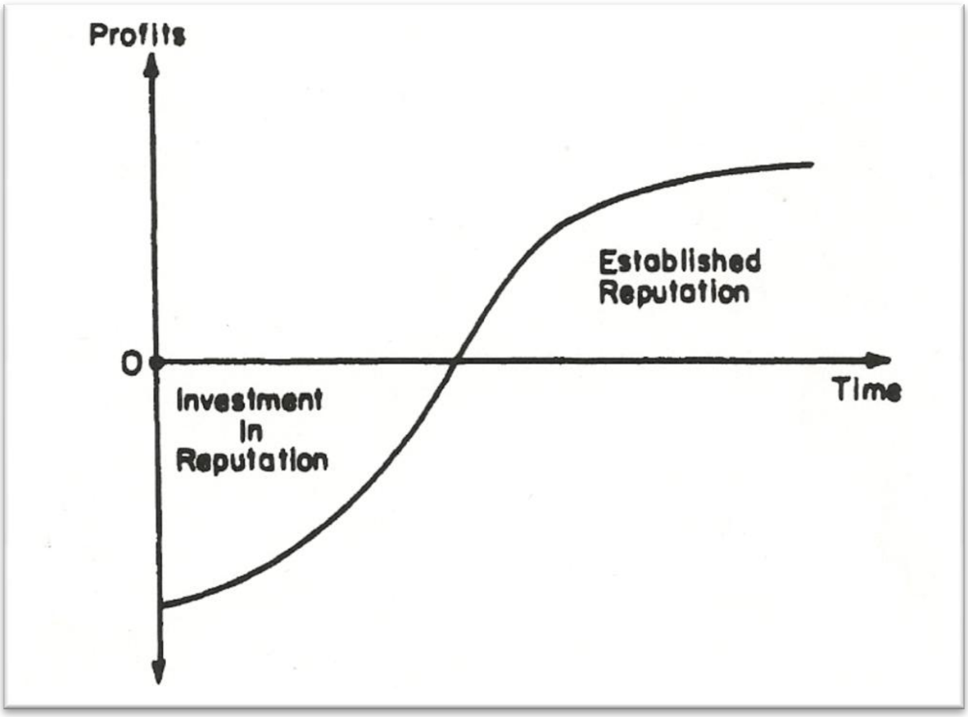

Figure 2.2: The investment in reputation and the premium for high a quality product (Source: Shapiro, 1981)

In relation to the audit market, Moizer (1997) claims that the signalling hypothesis does not necessarily entail a higher quality audit because it simply leads the market users to believe that the more expensive auditing firms offer a higher quality of service. Consistent with this is DeAngelo's (1981) assertion that since audit quality is unobservable and costly to measure, the market tends to use good reputation, derived from large auditors, as a signal of a higher quality audit. As mentioned in Shapiro (1983: 659):

> "The idea of reputation only makes sense in an imperfect information world. A firm has good reputation if consumers believe its products to be of high quality. If product attributes were perfectly observable prior to purchase, then previous production of high quality items would not enter into consumers' evaluations of a firm's product quality. Instead, quality beliefs could be derived solely from inspection."

2.3.5 Insurance hypothesis

The insurance hypothesis differs from the agency relationship hypothesis and it applies when auditors are involved in litigation. It suggests that audit services provide investors with a form with of protection in the event of an audit failure (Wallace, 1980; Menon and William, 1994; Stice, 1991). In other words, the legal system allows the investors to recover their investment losses from the auditor if the audited financial statements contain a misrepresentation or a low quality audit. The probability of recovering such claims increases if the auditors are among the larger audit firms or those known as 'deeper pockets' (Schwartz and Menon, 1985).

Wallace (1980: 21-22) provides four explanations of why managers choose auditors as insurance in preference to insurance companies. Firstly, society assumes that managers who fail to guarantee that they are fully independent of their actions, without the auditors' attestation, are committing fraud or are involved in negligence. Secondly, the improvement in accounting and auditing firms that employ legal staff, legal services and in-house counsels, suggests that they are more efficient compared with insurance companies. Thirdly, the insurance companies use the cost-benefit approach when deciding whether to enter a legal defence or to decide on an out of court settlement. However, both the auditors and the firms that are involved in litigation will consider the effect on their reputation and thus, with a similar common interest, they will ensure that they protect their reputations. Fourthly, if investors suffer from losses because of an audited financial statement, the courts are likely to hold the auditors responsible and to require them to bear the losses. An auditor's contributions to an investor's losses are viewed by the court as 'socializing risk'. As stated in Wallace (1980: 22), "… because he is responsible for business failures, the auditor in turn shifts this cost to clients through higher fees and then to society through higher prices and lower returns on investment."

Several studies have empirically tested the insurance hypothesis. For instance, Menon and Williams (1994) use the case study of Laventhol and Horwath (L&H)[14] and they examine the effect of L&H clients' stock price (1) when L&H filed their bankruptcy

[14] Laventhol and Horwarth (L&H) is one of the seventh-largest public accounting firms in the U.S. They declared bankruptcy on November, 1990 and filed for protection under Chapter 11 of the US Federal Bankruptcy Code.

and (2) on the announcement of a replacement auditor. They hypothesize that when L&H filed for bankruptcy, they came to the end of the operation and their investors no longer had access to recover their investment losses. Thus, their clients' stock prices were expected to decline. When the clients of L&H reappointed a new auditor, they assumed that the investment losses from L&H were not transferable to the new auditor, since investors can only claim from them if they have used the audited financial statement (prepared by the new auditor) for their investment decision. If the insurance hypothesis bears upon the L&H bankruptcy case, such a new appointment could provide a significant reaction in stock prices. However, if the market perceives that the appointment of new auditors could clarify the uncertainty of future monitoring, it may result in positive return. Their findings are consistent with the insurance hypothesis. The price reaction on both events supports the argument for the absence of the expected insurance coverage thus: the disclosure of the L&H bankruptcy had negative impact on their stock prices and the announcement of a replacement new auditor did not provide any significant reaction.

In addition to this, Baber et al (1995) suggest that such price reactions were also driven by the monitoring function of L&H in which the insurance and monitoring hypotheses are difficult to differentiate. They suggest that financially distressed auditors are more likely to perform low quality audits because they are more concerned with their current position than with their competence and independent judgement. For example, in order to retain their clients and minimise their audit cost, financially distressed auditors are less likely to report an error or a misstatement that they discover during the auditing work or they may reduce audit testing in order to cut down the audit cost. They argue that if the investors were aware and if they perceived that L&H was incompetent and independent, then such a perception may have forced the stock prices to decline. However, Lai and Gul (2008) provide contradictory evidence to Baber et al. (1995). Using the likelihood of issuing modified audit opinion, the provision of discretionary accruals and the predictability of discretionary accruals for future earnings as proxies for audit quality, they suggest that the audit quality of L&H was not substandard.

In another study, O'reilly et al. (2006) examine the interaction of signalling and insurance hypotheses through studying audit opinion in an experimental setting. They argue that a going-concern audit opinion (1) provides signals to the market that the firm is no longer feasible, thus affecting stock prices; (2) offers the auditor legal protection, although there is a possibility that investors are able to recover part of their investment' losses and (3) increases the value to investors because of the increased need for insurance coverage. Their findings suggest that the going-concern audit opinion reduces analysts' estimation of stock price because market participants consider the auditors' role as an insurance protector. In sum, the insurance hypothesis provides the most consistent support for the view that auditors are perceived by investors as the guarantors of their investment and investors "appear to be willing to pay a premium for the right to recover potential investment losses from auditors through litigation" (Menon and William, 1994: 341).

As well as increasing the direct costs that auditors need to charge for in order to cover for investors' losses, such lawsuits also have an indirect impact on their reputation and perceived audit quality (Palmrose, 1991). The findings of Chaney and Philipich (2002) are consistent with those of Menon and Williams (1994) and Baber et al. (1995). They investigate the impact of the Enron audit failure on Arthur Andersen's (A&A) reputation as one of the big-five auditors. They examine the A&A clients' stock prices on the three days after A&A admit they shredded a significant number of audit documents related to the Enron engagement. Such an unexpected event results in a significant negative market reaction on the A&A clients' stock prices, suggesting that investors acted on the perceived low quality of the audit performed by A&A

In a similar form of study Hillison et al. (2004) examine the audit clients' stock price reaction related to Ernst & Young's (EY) rumours of bankruptcy in late November and early December 1990 (event studies). Their findings suggest that the insurance hypothesis and the audit quality explanation account for the negative stock price reaction. Even though the big-4 auditors may provide a higher quality audit, market participants still react according to newly published information. When market participants lose their confidence in the credibility of audited financial statements, it effects a reduction in clients' stock price.

Lennox (1999) has empirically tested the insurance hypothesis and reputation exposure (under the signalling hypothesis) using UK data between the periods of 1987 and 1994. According to the reputation hypothesis, the big-size auditors signal their audit quality by assuming that they are more likely to lose their client-specific rent when they provide a low quality audit. In order to avoid such loss, they have more incentive to provide a higher audit quality (DeAngelo, 1981). The alternative to this argument is that the wealth auditors or big-size auditors are associated with higher litigation risk (Dye, 1993). Similarly, in order to prevent such larger litigation claims (e.g. because of low quality audit) from the investors, the big-size auditors offer a more credible and higher audit quality. Lennox (1999) posits that the lower the audit quality undertaken by the auditors, the higher the potential of such auditors to be sued (because they fail to detect and report misstatement or negligence). He argues that, in the case of the big-size auditors that gain their 'quality' from reputation capital, the auditor's litigation provides an accurate indicator. However, the insurance hypothesis considers the auditor's litigation to be a poor indicator because the auditors are likely to be sued if they are insufficiently conservative (type I error), but they will not be sued are if they are too conservative (type II error). Thus, although the big-size auditors provide higher audit quality than a smaller size auditor, there is a higher probability that they will be sued when a type I error arises. Lennox's findings suggest that the big-size auditors are more likely to be sued because they are more fearful of a potential litigation claim than of losing their client-specific rent or reputation capital.

2.4 The association between board of directors, audit committee, external auditor and financial reporting quality

There are two research questions to be examined in this thesis. The first question concerns the relationship between the effective board and audit committee, and audit quality. The second question is concerned with the relationship between the effective board of directors, audit committee and auditor quality in constraining earnings management. Prior to explaining the reasons why these parties demand a higher quality audit and why they are more likely to constrain earnings management, it first reviews the roles of boards of directors and audit committees and their connection to an external audit.

The board of directors is the main player in the success of a firm. They are responsible for setting the goals, strategies and values of a firm, in order to align them with the interests of their shareholders (UK Corporate Governance Code, 2010). They are also responsible for the transparency and fairness of financial statements, a duty which has been clearly stated in the Companies Act 1985 and the Company Reform Bill. Section 226 of the Companies Act 1985 requires directors to prepare and assume responsibility for the individual account and administration of the firm. While, Section 366 (1) of the Company Law Reform Bill (2005: 164) states that directors must not approve these accounts except they are satisfied themselves that the accounts have give true and fair view and have been prepared accordingly to the relevant financial reporting framework. These accounts, having been prepared and approved by the directors, are required to be audited by an external auditor as they are to be used by the public.[15] As the highest point in the hierarchy of a firm's structure, the board of directors is accountable for all a firm's activities, strategies and financial performance including the sub committees' actions.

Under a main board, there are several subcommittees, one of which is the audit committee. The audit committee has a direct link with the financial performance of the firm and the external audit services. Wolnizer (1995: 47-48) discusses in detail the tasks that audit committee members are expected to perform, from three perspectives:

(1) accounting and financial reporting – The audit committee reviews financial statements, accounting policies, fraud, internal control, changes and all significant matters that could affect the financial statements.

(2) auditors and auditing – The audit committee provides recommendations for the external auditors, reviews the scale of audit fees and non-audit fees, writes a letter of engagement, reviews the audit plan, ensures auditor independence and allocates resources on the internal audit. In relation to the audit fees, Collier and Gregory (1996) claim that an effective audit committee is responsible for ensuring that the scope of an audit is sufficient, and to some extent the audit committee is able to ensure that the reduction of audit fees does not reach a level where it may potentially jeopardize the quality of audit work.

[15] As stated under Section 235 and 237 of Company Act, 1985 and Section 485to 488 of Company Reform Bill.

(3) corporate governance – The audit committee facilitates the relationship between the auditors and the board of directors, as well as reviewing and complying with corporate policies, ethical policies and codes of conduct.

By implementing these tasks (1 to 3), firms are expected to enhance the credibility, objectivity and reliability of financial statements, improve the accountability of management staff, reduce any opportunistic behaviour of management, increase the efficiency and effectiveness of internal control as well as that of internal and external audits and strengthen the function of the board of directors while helping them to meet their legal responsibilities (Wolnizer, 1995: 49). The overall implication is that the activities of an audit committee could improve the quality of financial reporting and corporate governance of firm.

Similarly, Menon and Williams (1994: 123) suggest two possible advantages to be gained by establishing an audit committee. Firstly, the independent audit committee may act as an independent party between the internal audit and the external audit. The independent members of an audit committee help them to provide an unbiased assessment between internal audit function and external audit services, which in turn improves the quality and integrity of a firm's financial statements (Imhoff, 2003). Secondly, the audit committee may enhance the efficiency of a board's function particularly when the board has a large number of directors

Furthermore, The Blue Ribbon Committee (BRC, 1999: 19) also agrees that the formation of an audit committee can enhance the credibility of the reported financial statements and thus maintain the investors' confidence. They stated that:

> "…the Committee believes audit committee will be more effective in helping to ensure the transparency and integrity of financial reporting and, thereby, maintain the investor confidence that makes our securities markets the deepest and most liquid in the world."

In addition to the important role of a board of directors and an audit committee, Bailey and Grambling (2005) suggest that an external audit serves as a key determinant of financial reporting quality. Power (1996) claims that an external audit adds credibility to the financial report provided by management. DeAngelo (1981) argues that the auditors improve the quality of financial reports through their competency and independence audit. Furthermore, Ruddock et al. (2006) claim that the quality of financial reporting is improved when the auditors respond to the aggressive earnings conservatism.

Anderson et al. (2001) posit that when a manager has a higher incentive to manage earnings, the auditor perceives that manager as more aggressive, as having a greater desire to look good in their financial statements and as expecting the auditors to agree with their financial statements. Therefore, auditors will limit earnings management when they believe that managers are manipulating financial statements. Moreover, according to Krishnan (2003b), by constraining earnings management, the auditors are able to improve the information value of earnings. If the market perceives that auditors are unable to limit opportunistic earnings, then the earnings' information value would be diminished simultaneously. According to Sankar and Subramanyam (2001), the restriction imposed by GAAP, and by auditors, on the discretion of reporting earnings may improve the content of earnings' information.

There is a direct and an indirect link between the role of a board, an audit committee and an external auditor. Under the direct relationship, the principal roles of an audit committee are to make a recommendation to the board in relation to the appointment of the external auditor, to review the audit engagement and the audit fees and to monitor the external auditor's independence and objectivity as well as the effectiveness of the audit process (UK Corporate Governance Code, 2010). As previously stated, in relation to the audit engagement and proposed audit fees, an effective audit committee is responsible to ensure that the scope of an audit is sufficient and that the proposed audit fees do not potentially jeopardize the quality of auditing work (Collier and Gregory, 1996). The reason for this is because auditors seek to minimise the total cost of an audit and endeavour to achieve a balance between the costs of audit resources and expected future losses as a result of legal liability (Carcello et al., 2002). It is reasonable to expect that an effective board of directors first reviews the overall scope of an audit and the proposed audit fees before accepting a proposal from the audit committee, since the board of directors is accountable for all their the sub committees' actions. In respect of auditor independence, specifically the provision of NAS, the authoritative guidance requires an audit committee to review NAS engagement and make sure that relevant procedures are in place to ensure that the independence and objectivity of the auditors are not affected by the undertaken NAS. An audit committee is responsible for reporting and making recommendations to the board of directors on any actions taken to ensure that the auditor's independence has been safeguarded (UK Corporate Governance Code, 2010: 20).

Indirectly, an effective board and audit committee may signal to management and auditor that they exercise a higher and more vigilant oversight function. For example, when management perceives that a board and audit committee are performing a higher monitoring function, they may voluntarily consider limiting the purchase of NAS (Abbott et al., 2003b) and will limit their own opportunistic earning behaviour by employing higher quality auditors. Similarly, auditors may see that an effective board and audit committee are associated with having a higher monitoring function and they are thus likely to be more demanding and to insist on having a higher quality audit (Carcello et al., 2002).

Why do boards of directors and audit committees demand different levels of audit quality? Why do they constrain earnings management? Similarly, why do external auditors limit opportunistic earnings management? The answers to these questions lie in their implications for reputation capital, legal exposure and shareholder interests (Carcello et al., 2002).

The reputation hypothesis posits that vigilant directors make costly investments to establish their reputation as effective monitors and, in return for being good monitors, they might be rewarded with an additional directorship in another firm (Fama, 1980; Fama and Jensen, 1983). Evidence suggests that when directors suffer a damaged reputation, they are less likely to get opportunities to serve on another board. For example, Gilson (1990) claims that the outside directors of firms in financial distress hold significantly fewer seats on other boards following their departure, possibly due to reputation effect and legal exposure. In another study, Fich and Shivdasani (2007) examine the reputation impact for the outside directors of firms that are involved in financial fraud. They find that outside directors lose about 50 percent of their directorships in other firms when one of the firms that they serve is involved in financial fraud lawsuits. This finding indicates that sued directors on a board are seen as weak monitors who may increase the likelihood of financial misconduct occurring. Moreover, they also find that a reduction in directorships may be driven by an outside directors' desire to reduce their future legal exposure.

The reputation hypothesis is also applicable to auditors. A highly reputable auditor has an incentive not to produce a low quality audit because, once their clients discover that they provide a low quality audit, their reputation will be damaged and they will be unable to secure their clients and they will lose quasi rents (DeAngelo, 1981). Wilson and Grimlund (1990) provide evidence of the consequences that auditors may suffer if their reputations are damaged. They examine the effect of SEC disciplinary actions on audit firms and their findings suggest that the auditors tend to lose their market share and that they experience difficulty in retaining clients. In general, the auditors are likely to constrain earnings management because of the possibility of being sued or subjected to regulatory actions. These may be due to negligence in identifying misleading information in the audited financial statement. Evidence suggests that auditor litigation has positive relationship with earnings management (Lys and Watts, 1994; Heninger, 2001)[16] and a failure to fulfil their role effectively or a neglect of their duties may increase an auditor's potential for future legal exposure (Lennox, 1999).

As well as considering reputation capital and legal exposure, a board of directors and audit committee demand a higher quality audit in order to promote the shareholder's interests (Carcello et al., 2002). Several studies have suggested that investors perceive that the provision of NAS negatively affects auditor independence and undermines the audited financial statement. Lavin (1976; 1977) and Firth (1980) examine the perception of accountants, financial analysts and loan officers in the US and UK, respectively. Their findings suggest that when auditor independence is deemed to be impaired, investment and borrowing decisions will also be affected. These studies may suggest that investors are unfavourable towards a firm if they perceive that the auditing of financial statements has been impaired by the purchase of NAS. Therefore, the board of directors and audit committee monitor auditor independence

[16] The auditors are subject to lawsuits for the overstated earnings (Lys and Watts, 1994; Heninger, 2001) but reveal no evidence for understated earnings (St. Pierrie and Anderson, 1984).

(e.g. in terms of the levels of NAS) in order to gain the investors' confidence and promote the shareholders' interests.

A higher quality auditor may perceive by the investors to be associated with a higher credibility of information, which in turn increase the firm value (Titman and Trueman, 1986; Datar et al., 1991). Indeed the investors assume that the higher quality auditors are more sensitive to earnings surprises. For example, the existing studies suggest that the firms engage or switch to big-size auditors have lower earnings management and higher earnings respond coefficient compared to smaller size auditors, consistent to the view that big-size auditors provide more credible information to investors (Teoh and Wong, 1993; Becker et al., 1998). In other study, Khurana and Raman (2006) suggest that the higher NAS fees and total fees received by the auditors are viewed negatively by the investors because higher fees could possibly compromise the auditors' independent and audit quality through the auditors' economic bonding on clients. Such views have been expressed into the investor perception as a lower *ex ante* cost of equity capital.

Overall, higher quality audits and a higher quality of reported earnings are not only useful for investors and the users of financial statements, but they are also beneficial to auditors, boards of directors and audit committees because they are able to minimise the potential for damaged reputation and legal exposure while also raising the support of shareholders.

2.5 Summary

Agency theory assumes that principals and agents have divergent interests and thus are likely to contribute to agency conflicts that include the phenomenon of earnings management. To align these interests, agency theory recognises the monitoring roles of a board of directors, an audit committee and external auditing as playing a part in the mitigation of agent-principal conflict. From the agency perspective there are several characteristics of board and audit committee (e.g. size, composition, expertise and levels of activities) that contribute to an effective monitoring function. The independent audit is also acknowledged by the agency theory as a control mechanism to reduce information asymmetry between the shareholders/investors and management by promoting truthfulness and fairness in financial statements. Several hypotheses have explained why shareholders/investors or management demand auditing services and different levels of audit quality. These hypotheses include the monitoring hypothesis, information hypothesis, signalling/reputation hypothesis and insurance hypothesis. By employing a higher quality auditor and constraining earnings manipulation, a board of directors and audit committee assume that they are adding credibility to the financial statement and increasing a firms’ value. At the same time, the board and audit committee are able to secure their reputation capital, avoid legal exposure and promote the shareholders' interests. Similarly, a higher quality auditor is less flexible towards opportunistic earnings due to the risk that wrongly reported earnings may incur reputation damage, increase future legal exposure, decrease a firm’s value and disappoint shareholders.

CHAPTER 3
LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

3.1 Introduction

This chapter reviews the existing literature on three topics: audit quality, corporate governance and earnings management. It first reviews the definition of audit quality and how it is measured, and this is followed by discussion and review of the effective characteristics of boards and audit committees. Previous studies of earnings management, particularly those related to the motivation for earnings and earnings management measurement, are also reviewed. These reviews provide a general understanding of the areas of study that is being investigated in this thesis.

Towards the end of this chapter, the discussions and reviews focus on the association between corporate governance and audit quality and between corporate governance and auditor quality in respect of constraining earnings management. These reviews help to identify similar studies that have been done and which provide potential evidence of research gaps that demand further investigation. For each of the main relationships, the development of tested hypotheses is also disclosed. Finally, the summary and conclusion are presented in the last section.

3.2 Definition of audit quality

The most common definition for audit quality is derived from DeAngelo (1981: 186), she defines audit quality as “the market assessed joint probability that a given auditor will both (a) discover a breach in the client’s accounting system and (b) report the breach.” This definition is accessed by market as the ability of an auditor to detect accounting misstatements and then to express them in appropriate audit opinion. Watts and Zimmerman (1986) simplify DeAngelo’s definition where the first part refers to auditor’s competence and the quantity of inputs devoted to the audit, while the second part refers to an auditor’s independence. In other words, according to Watts and Zimmerman, any factors that are associated with a lack of auditor competence or a lack of auditor independence are able to compromise the quality of audit. [17]

Palmrose (1988) describes audit quality in terms of levels of assurances. Higher levels of assurances (i.e. possibility that financial statements contain fewer errors or misstatements) are associated with a higher audit quality and *vice-versa*. The grounds for this definition have been developed from audit failures (where an auditor has failed to detect a material error or misstatement) than can be traced in litigation cases. According to Francis (2004), audit failure can be classified as extremely low audit quality (end quality) that can result in several outcomes such as regulatory sanctions, litigation rates, business failure and earnings restatement.

From the regulator's perspective, ICAEW (2002: 8) suggests a definition for audit quality by stating that, "At its heart [audit quality] is about delivering an appropriate professional opinion supported by the necessary evidence and objective judgements." As long as the auditors provide an independent audit opinion that is supported by adequate audit evidence, the regulator assumes that such auditors have performed a quality auditing service.

Despite the fact that technical qualities, such as an auditor's ability to detect and report errors, have been argued as the defining aspects of audit quality, Duff (2004) suggests that audit quality is made up of both technical quality and service quality (the levels of clients' satisfaction and expectations). Technical quality consists of reputation capital, capability, expertise, experience and independence scales, while

[17] Beattie et al. (1999: 71) claim that there are two broad categories of factors that affect an auditor's independence. They are, namely, economic and regulatory factors. They suggest that the economic factors are related to an auditor's economic dependence on clients, competition among auditors in the audit market, the provision of NAS, and deficiencies in the regulatory frameworks. The regulatory factors are those factors that are associated with accounting and auditing standards. For example in promoting the auditor independence, the Cadbury report (1992) provides the recommendation that the formation an audit committee is able to strengthen the auditors' independence and thus to enhance audit quality. Arruñada (2000) appends that the term "independent" is not exclusively confined to the relationship between the main client and auditor, but that it also encompasses other important attributes such as third parties and other clients. He cites the example of a client being more worried when the company of an auditor's other client collapses without prior notice than they are about having low quality audit. As a consequence, "clients have very strong incentives to monitor, evaluate and compensate audit firms' quality" (Arruñada 2000: 218).

service quality is defined by responsiveness, empathy and the provision of NAS and client services.[18]

Following DeAngelo's and Watt and Zimmerman's definitions, this thesis defines audit quality as the competence of the auditors to detect errors and the objectivity (in *fact* and in *appearance*) of the auditors in reporting such errors.[19] The terms "audit quality" and "auditor quality" are assumed to be synonymous, and this is consistent with Clarkson and Simunic's (1994: 208) suggestion that "an audit firm is assumed to supply a single level of audit quality that at a moment in time."

Several factors may influence the quality of an audit. Wooten (2003) claims that audit firms, audit teams and the professional judgement or auditor independence are the principal contributors to audit quality (as shown in Figures 3.1). A audit firm and audit team factors (e.g. human resources, audit processes, industry expertise, supervision, audit planning, and professionalism) directly contribute to the skill and competence of auditors in detecting errors and misstatements. The factors of audit tenure, audit fees and NAS not only directly impair auditor independence, but they also implicitly support auditor effectiveness.

In addition, FRC (2008) suggests five key drivers for audit quality: (1) the audit firm culture, (2) skills and personal qualities of audit partners and staff, (3) the audit process, (4) usefulness of the audit reporting and (5) factors that are outside the control of the auditors (refer to Figure 3.2 for detailed outlines of key drivers). FRC (2008) suggest that the roles of internal governance mechanisms (e.g. audit committees) and regulatory requirements may help to improve audit quality. An

[18] The independence and NAS scales are relatively different from each other (Duff, 2004: 110).

[19] Consistent with AICPA (2009), in this thesis, the auditor objectivity or auditor independence *in fact (mind)* and *in appearance* are defined as: "*Independence of mind*—The state of mind that permits the performance of an attest service without being affected by influences that compromise professional judgment, thereby allowing an individual to act with integrity and exercise objectivity and professional scepticism. *Independence in appearance*—The avoidance of circumstances that would cause a reasonable and informed third party, having knowledge of all relevant information, including safeguards applied, to reasonably conclude that the integrity, objectivity, or professional scepticism of a firm or a member of the attest engagement team had been compromised."

effective audit committee is capable of enhancing audit quality through active involvement during the audit period and effective communication with the auditors.

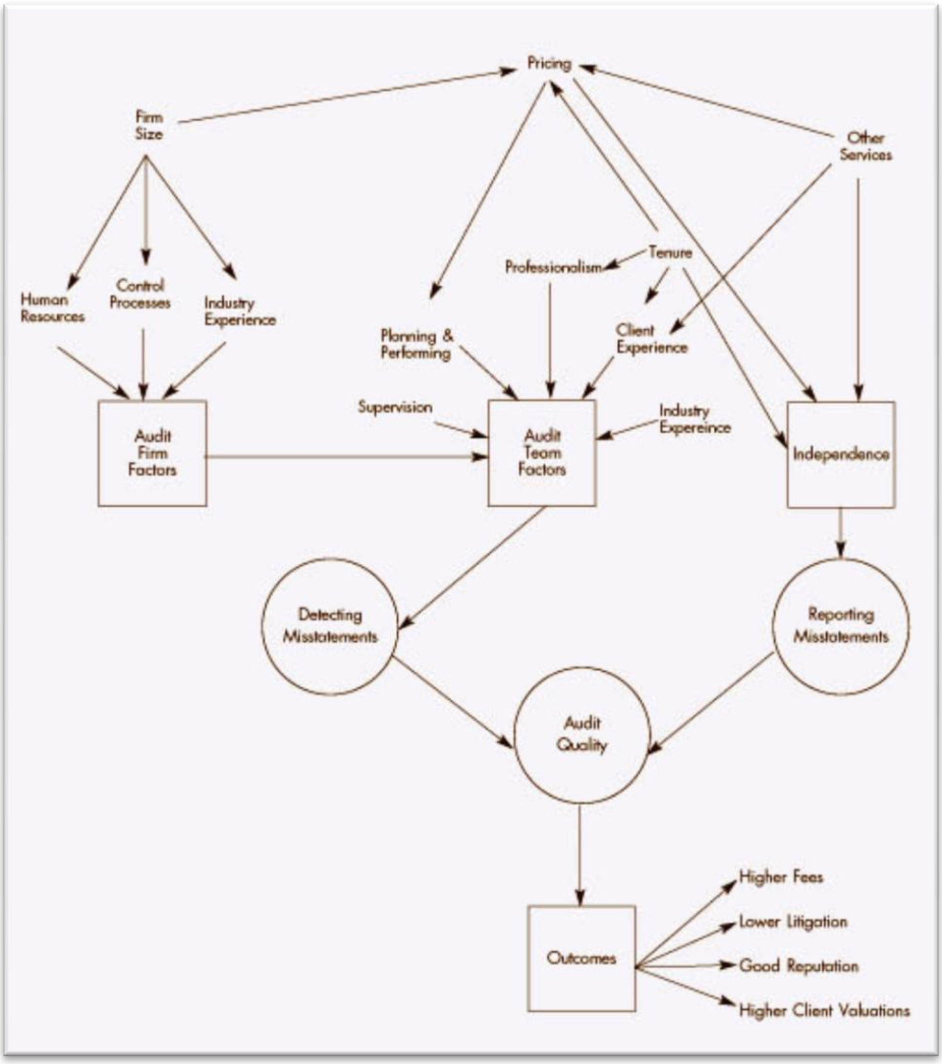

Figure 3.1: A model of audit quality (source: Wooten 2003)

To sum up, audit quality can be described as the ability of an auditor to provide an independent audit which results in a financial statement that is free from misstatement, error and fraud. Since an audit's quality is influenced by three main parties (audit firm, audit' client and regulators), the attributes or factors that are associated with each group can be used as indicators for audit quality.

Drivers	Indicators
The culture within an audit firm	The culture of an audit firm is likely to provide a positive contribution to audit quality where the leadership of an audit firm: • Creates an environment where achieving high quality is valued, invested in and rewarded. • Emphasis the importance of ‘doing the right thing’ in the public interest and the effect of doing so on the reputation of both the firm and individual auditors. • Ensures partners and staff have sufficient time and resources to deal with difficult issues as they arise. • Ensures financial considerations do not drive actions and decisions having a negative effect on audit quality. • Promotes the merits of consultation on difficult issues and supporting partners in the exercise of their personal judgment. • Ensures robust systems for client acceptance and continuation. • Fosters appraisal and reward systems for partners and staff that promote the personal characteristics essential to quality auditing. • Ensures audit quality is monitored within firms and across international networks and appropriate consequential action is taken.
The skills and personal qualities of audit partners and staff	The skills and personal qualities of audit partners and staff are likely to make a positive contribution to audit quality where: • Partners and staff understand their clients’ business and adhere to the principles underlying auditing and ethical standards. • Partners and staff exhibit professional scepticism in their work and are robust in dealing with issues identified during the audit. • Staff performing detailed ‘on-site’ audit work has sufficient experience and are appropriately supervised by partners and managers. • Partners and managers provide junior staff with appropriate ‘mentoring’ and ‘on the job’ training. • Sufficient training is given to audit personnel in audit, accounting and industry specialist issues.

continued	
Drivers	Indicators

The effectiveness of the audit process	An audit process is likely to provide a positive contribution to audit quality
	where:
	• The audit methodology and tools applied to the audit are well structured and:
	  ○ Encourage partners and managers to be actively involved in audit planning.
	  ○ Provide a framework and procedures to obtain sufficient appropriate audit evidence effectively and efficiently.
	  ○ Require appropriate audit documentation.
	  ○ Provide for compliance with auditing standards without inhibiting the exercise of judgment.
	  ○ Ensure there is effective review of audit work.
	  ○ Audit quality control procedures are effective, understood and applied.
	• High quality technical support is available when the audit team requires it or encounters a situation it is not familiar with.
	• The objectives of ethical standards are achieved, providing confidence in the integrity, objectivity and independence of the auditor.
	• The collection of sufficient audit evidence is not inappropriately constrained by financial pressures.

The reliability and usefulness of audit reporting	Audit reporting is likely to provide a positive contribution to audit quality where:
	• Audit reports are written in a manner that conveys clearly and unambiguously the auditor's opinion on the financial statements and that addresses the needs of users of financial statements in the context of applicable law and regulations.
	• Auditors properly conclude as to the truth and fairness of the financial statements.
	• Communications with the audit committee include discussions about:
	  ○ The scope of the audit.
	  ○ The threats to auditor objectivity.
	  ○ The key risks identified and judgments made in reaching the audit opinion.
	  ○ The qualitative aspects of the entity's accounting and reporting and potential ways of improving financial reporting.

continued	
Drivers	Indicators
Factors outside the control of auditors	Factors outside the control of auditors which are likely to make a positive contribution to audit quality include: • An approach to corporate governance within the reporting entity that attaches importance to corporate and financial reporting and to the audit process. • Audit committees that are active, professional and robust in dealing with issues identified during the audit. • Shareholders that support auditors, where appropriate, thereby increasing the likelihood that directors and management will comply with their obligations in relation to the preparation of reliable financial statements. • Reporting deadlines that allow the opportunity to carry out an audit without undue reliance on work performed before the end of the reporting period. • Appropriate agreed arrangements for any limitation of liability. • An audit regulatory environment that focuses on the drivers of audit quality.

Figure 3.2: The key drivers of audit quality (source: FRC, 2008)

3.3 A possible approach to measuring audit quality

The measurement of audit quality is complex and problematic (see e.g. Wooten, 2003; Niemi, 2004; Jensen and Payne, 2005). However, Bailey and Grambling (2005), Francis (2004) and PCOB (2008) have identified several potential measures for audit quality in both academic literature and in practice. These measures are perceived as factors, indicators, behaviors or perceptions that have a direct and an indirect link with audit quality as defined in the previous section.

Bailey and Grambling (2005) and PCOB (2008) discuss potential measures of audit quality based on the audit process that is adhered to in completing an audit engagement. These measures are associated with the audit procedures, the documentation of audit evidence and compliance with auditing standards. They classify them as input and output-based measures. Bailey and Grambling (2005) suggest that the inputs of audit processes are relevant to the quality control system of an audit firm. These include (1) how audit firms put an effort into promoting and emphasising desirable qualities (e.g. independence, objectivity, and professionalism), (2) internal control (e.g. an audit firm’s internal review), (3) human resources (e.g.

competence and independence of staff) and (4) audit methodologies (e.g. audit policies and procedures). Moreover, in respect of human resources, Bailey and Grambling (2005: 15) suggest that the skills and competencies of auditors should be viewed in a broader context which goes beyond technical accounting and auditing skills. They argue that the level of professional scepticism of auditors may affect their ability to act independently when executing auditing work. Thus, the attribute of 'independence' is desirable for every auditor and audit team member when it comes to achieving a higher audit quality.[20] In short, Bailey and Grambling (2005: 14) state that "if audit quality is defined on the basis of inputs, those inputs could be loosely described as the 'right' people, applying the 'right' tools and procedures in the 'right' organisational culture which includes appropriate internal monitoring". The output-based measures specifically relate to the audit opinion and whether that audit opinion reflects the "accuracy of management's assertions", and it includes the issuance of going concern audit opinion and restatements (Bailey and Grambling, 2005:13).

As an alternative to the suggestions that are given by Bailey and Grambling (2005), PCOB (2008) defines the input-based measures as the things and procedures that auditors have taken into account in arriving at a given audit opinion (e.g. the audit procedures used in detecting fraud, the experience levels of audit staff and audit partners, and the annual staff retention). The output-based measures refer to outcome or evidences that an auditor produces from work that has been undertaken. Such outcomes, for instance, can be measured by the number of frauds discovered and numbers of errors or misstatements detected.

In general, the potential measures of input and output given by Bailey and Grambling (2005) and PCOB (2008) are limited to the factors that are associates with the audit process that was adhered to in completing an audit engagement. These factors of audit quality are beyond the audit process itself. A users' perception of audit quality is claimed to be one of the alternative measure for audit quality (e.g. audit fees, NAS fees and industry specialist auditor). Specifically, users reckon audit quality based on an auditor's reputation. Khurana and Raman (2006) claim that a user's perception of

[20] "Independence in fact allows the auditor to exercise judgement with an objective viewpoint, thus achieving actual audit quality, while independence in appearance leads investors to trust that the auditor is exercising professional judgement in an objective fashion" (Bailey and Grambling, 2005:15)

audit quality is important because it reflects public trust and confidence in a firms' reported financial information. Recognised the important these, in this thesis the audit quality measures will be based on the users' perceptions.

Despite the various measures of audit quality that been used in the existing studies, the present study acknowledges the limitation of these measures. For example, with regard to an input-based measure, how do we ensure that the consistency of the input's attributes has not been diminished during the process of the audit engagement? Perhaps, information about the key drivers of audit quality, such as the education, experience and competency of the auditors is not publicly available and difficult to obtain. By using output-based measures the result of an audit is not necessarily observable just after work has been undertaken because the quality of audit information usually emerges over a certain period during which restatement or business failure or the identification of misstatements can occur (PCOB, 2008:9). The measures, such as audit firm size, that reflect an auditor's reputation may not be essentially accurate measures of audit quality. While there are factors that are believed to compromise auditor independence, such as NAS and audit tenure, it has also been argued that these same factors can enhance an auditor's knowledge and competency. The existing studies recognise that, to the certain extent, some measures (e.g. industry specialist auditors) have demonstrated a strong relationship with higher audit quality. The lack of the empirical evidence to support some measure as better audit quality indicators, does not mean that these measures are insignificant, as they may complement qualitative research on audit quality.

In this thesis, three measures of audit quality will be employed based on auditor reputation and auditor independence points of view, namely, audit fees, NAS fees and industry specialist auditors. These measures have been extensively used in prior auditing research and each of them is now reviewed.

3.3.1 Audit fees

The link between audit fees and audit quality is suggested by the signalling or reputation hypothesis (Lindberg, 2001). Models of reputation capital suggest that sellers expend resources in order to build a reputation because buyers are unable to determine product quality before purchasing (Klein and Leffler, 1981; Shapiro, 1983;

Rogerson, 1983; Allen, 1984). Once a sellers' reputation has been established, they are able to convince buyers that their products have higher quality-assuring price, and thus earn economic rents. If buyers discover that sellers produce a low quality product (i.e. at the minimum-quality price), their established reputation will be impaired and the economic rents assigned to the higher quality product will disappear (Klein and Leffer, 1981). As concluded by Klein and Leffer (1981: 634), "our analysis implies that consumers can successfully use price as an indicator of quality".

There are several arguments for the proposition of audit fees as proxy for audit quality. Several studies suggest that higher audit fees are associated with higher audit quality in order to compensate for the high-price of reputation capital (i.e. big-size), auditors' industry specialization, as well as for increased audit effort (see Simunic, 1980; Palmrose, 1986a; Craswell et al., 1995; Ferguson and Stokes, 2002).

Craswell et al. (1995) argue that the reputation development of an auditors' brand name and industry specialization consumes a higher cost and thus results in higher audit fees. Evidence suggests that audit clients are willing to pay a fee premium on these auditors' reputations in order to get a better quality of service. The brand name auditors demonstrate the effect of a Big 8/6/4 premium that is justified for higher reputation capital, and thus they convey a higher quality differentiation compared to non-brand name auditors (Simunic, 1980; Palmrose 1986a).

According to Palmrose (1986a: 108), the Big 8 auditors charge higher audit fees for two reasons: they indicate (1) higher audit quality or (2) monopoly pricing. After substituting the audit fees variable for audit hours, her finding supports that the Big 8 auditors are consistent with higher audit quality providers. She indicates that "big eight designation is a quality surrogate, in that increased hours by big eight auditors would reflect greater productive activities (evidence acquisition) in providing higher levels of assurance (higher quality) to clients". As well as the brand name auditors, prior studies provide further evidence of the relationship between audit fees premiums and industry specialist auditors. Craswell et al. (1995) and Ferguson and Stokes (2002) claim that the brand name industry specialist auditors earn additional fee premiums over non-specialist brand name auditors, which indicates a higher audit quality differentiation among them.

In other study, Wolinsky (1983) argue that the price may signal a differentiation in levels of quality. Although sellers are potentially capable of producing the preferred and various levels of quality, the higher quality products are more costly to produce. DeAngelo (1981) claims that larger sized auditors or auditors that earn higher fees have more resources to invest when compared with smaller size auditors. Hence, they contribute more to improving the quality of their work (DeAngelo, 1981).

Elitzur and Falk (1996) suggest that audit fees have a positive relationship with planned audit quality. They examine planned audit quality and audit fees in a multiperiod model. Ordinarily, higher audit fees might inspire auditors to increase the audit quality. Hoitash et al. (2007) also agree that higher audit fees will increase the auditor's effort and result in a higher audit quality.

In recent studies related to corporate governance, evidence suggests that lower audit fees could also be associated with a perceived higher audit quality. This is because the auditor might take into consideration that firms bound by a strong internal control environment will probably have a lower audit risk thus reducing the audit effort and audit fees by means of an effective internal corporate governance mechanism (Tsui et al., 2001; Boo and Sharma, 2008b; Griffin et al., 2008; Krishnan and Visvanathan, 2009). Cohen et al., (2002) claim that an effective internal corporate governance mechanism may potentially contribute to a higher audit quality by lessening audit testing and enhancing the integrity of financial statements. Yeoh and Jubb (2001) suggest that an auditor and the internal corporate governance mechanisms share an identical common factor that contributes to a higher quality audit (i.e. independence from management). Griffin et al. (2008) provide evidence that the demand for audit services and internal corporate governance are co-determined by two countervailing relationships. In the first relationship, an increase in audit fees can occur due to the demand for effective corporate governance. The second relationship is associated with a decrease in audit fees because the auditors benefit from strong corporate governance and thus the audit risk and cost of auditing is reduced. Both relationships contribute to a higher audit quality. Consistent with this, Tsui et al. (2001) and Krishnan and Visvanathan (2009) suggest that those firms which separate the dual roles of CEO and chairman and the audit committee equipped with financial expertise, are perceived by auditors to have strong a internal control environment. This reduces the control risk and audit effort, leading to lower audit fees.

Besides the empirical evidence on the relationship between audit fees and audit quality that has been discussed above, several reports from the regulators emphasise the importance of audit fee setting and how it may affect the quality of auditing work (The Cohen Commission, AICPA 1978; Treadway Commission 1987; Cadbury Report 1992; Advisory Panel on Auditor Independence, 1994). For example, The Cohen Commission (AICPA, 1978) suggests that audit firms need to identify and manage audit fees and other issues related to the audit resources (e.g. staff, time and partners participation) as these factors are likely to devalue audit quality due to the higher competition in audit market. Similarly, the authoritative body in UK also draws attention to the audit fees factor and how it may influence audit quality. As postulated by ICAEW (2002: 9) "audit quality is achieved only if it is the keystone of the firm's overall strategy. Every single strategic decision taken by the firm will ultimately impact on quality including the firm's policy on audit fess". Concisely, ICAEW alleges that an audit firm's policy on audit fees is one of the components that may affect the quality of audits.

In opposition to the benefits of using audit fees as a proxy for audit quality, the present study notices the limitation that audit fees are an imperfect measure of audit quality. The audit fee is not necessarily accurate an as an indicator for audit effort as the appropriate measure for audit effort is the number of audit hours. However, Deis and Giroux (1996) provide some empirical evidence that audit fees and audit hour are significantly related to audit quality in their analysis of three important attributes: audit fees, audit hours and audit quality. Hence, it seems reasonable that more audit hours will lead to higher audit fees and promote a higher quality audit. In addition, to consider higher audit fees as a proxy for higher audit quality is consistent with signalling or reputation hypothesis.

3.3.2 NAS fees

The issue of the provision of NAS has been discussed broadly in the prior literature (see for example Beck et al., 1988a; 1988b; Beattie and Fearnley, 2002). The central arguments about NAS are generally concerned with auditor independence and whether the joint provision of audit and NAS enhances or reduces auditor independence. In other words, it is a question of whether the joint provision of NAS is able to increase or decrease the quality of an audit. [21] Beattie and Fearnley (2002) claim that there no formal theory of auditor independence and they suggest that most of the definitions of auditor independence basically highlight the importance of an auditor's objectivity and integrity.

Several studies suggest that the joint provision of audit and NAS may create potential benefits (see Simunic, 1984; Beck et al., 1988a; Arruñada, 1999a; 1999b; 2000; Wallman, 1996; Goldman and Barlev, 1974). These studies claim that the joint provision of NAS enhances an auditor's independence through economies of scope and the auditor's economic power. Economies of scope can be defined as the savings that arise when both services (audit and NAS) are jointly provided by the same auditors. They can be divided into two types, namely: knowledge spillovers and contractual economies of scope (Arruñada, 1999a; 1999b). Knowledge spillovers are derived from the transformation process that occurs when both services need to use a similar set of information and/or require similar professional qualifications (Arruñada, 1999a; 1999b). For example, when an auditor is undertaking an audit service, relevant information on the client's internal control system and competency in information technology are both necessary to the performance of the work. A similar set of information and qualifications are also essential to auditors when they are providing advice on a client's accounting information system. As mentioned by Wallman (1996), the gathered information flows both ways, when auditors undertake audit work they learn more about a client's business and this information is also useful when they provide NAS.

The second type of economies of scope are contractual economies of scope which are related to the contractual advantages that stem from making better use of assets and/or

[21] Since the definition of audit quality comprises aspects of the auditors' competency and their independence (DeAngelo, 1981; Watts and Zimmerman, 1986), the present study argues that any factors that are associated with auditor independence will also have an impact on audit quality. NAS include compliance and assurances services such as taxation, accounting advice, due diligence, internal audit, training, services to SMEs, corporate recovery and insolvency, legal, forensic and litigation support, mergers and acquisitions, recruitment and human resources as well as information systems and technology (Beattie and Fearnley, 2002; Arruñada, 1999a; 1999b).

the safeguarding of an auditor's reputation (e.g. big-size) that has already been developed through contracting and ensuring quality in auditing or NAS. The use of similar contractual resources, also referred to as "one-stop shopping", provides both supplier and client with advantages that are contractual in nature (Arruñada, 1999a: 775-6). In other words, clients and auditors can reduce the costs of searching and marketing for those services. Also, clients are assured of the quality of an auditor's performance. In addition to recognising the cost saving benefits of NAS, Goldman and Barlev (1974) and Nichols and Price (1976) provide a more complex view of auditor-client relationships. They suggest that economic power models provide the auditor with a potential source of power and independence to withstand auditor-client conflicts. Goldman and Barlev (1974) suggest that the higher the provision of non-routine NAS, the more important these services are to clients and the greater the power that an auditor would gain. Such an increase in auditor's power allows them to be more independent because they are more able to resist the client's pressure.

Despite the positive effects of NAS, their dual provision continues to be controversial and they are viewed with scepticism due to the potential that they may compromise auditor independence (Panel on Audit Effectiveness, 2000; SEC, 2001; Beattie and Fearnley, 2002) and cause economic dependence on clients (Beck et al. 1988a, b; Simunic, 1984). The foregoing evidence consistently suggests that both the user and the investor may perceive that NAS impaired audit independence (Wines, 1994; Firth, 2002; Frankel et al. 2002; Raghunandan, 2003; Sharma and Sidhu, 2001; Larcker and Richardson, 2004) and this outweighs their positive effect of NAS and reflects a declining in audit quality.

The first argument against the joint provision of NAS is the probability that it will make auditors economically dependent on their clients. As such, they are less likely to resist a client's pressure for the fear of losing them. As pointed out by Simunic (1984) and Beck et al. (1988a), the joint provision of audit and NAS creates knowledge spillovers or cost savings that lead to economic rents. In order to retain their clients, auditors tend to accept a client's preferences, and consequently they lose their objectivity. The second argument concerns the nature of NAS themselves and maintains that they may reduce an auditor's independence because of the conflict of interest that arises during the provision of audits and NAS. For example, they may audit their own work, take a managerial role or act on behalf of a client's management in an adversarial situation and, therefore, become too close to a client's management (Panel on Audit Effectiveness, 2000; SEC, 2001; Beattie and Fearnley, 2002).

In sum, generally, prior empirical studies provide inconsistent findings on the relationship between NAS and auditor's independence. Hartley and Ross (1972) claim that NAS are a minor problem in the total auditor independence issue.[22] Some studies argue that NAS have little impact on auditor independence (Ryan, 2001; Craswell, 1999) and a few suggest that NAS provide feasible advantages (Lai and Krishnan, 2009).[23] A number of empirical studies have been unable to find any association between NAS and auditor independence (Barkess and Simnett, 1994; Craswell, 1999; Ashbaugh et al., 2003; Chung and Kallapur, 2003; DeFond et al., 2002), whereas other studies provide evidence that the joint provision of NAS impairs auditor independence (Wines, 1994; Firth, 2002; Frankel et al. 2002; Raghunandan, 2003; Sharma and Sidhu, 2001; Larcker and Richadson, 2004).

In this thesis, consistent to the regulatory concern that NAS could compromise the auditor independence, the higher provision of NAS is indicate as a lower audit quality.

3.3.3 Industry specialist auditors

The theoretical foundation for the use of industry specialist auditors is derived from the reputation capital hypothesis as it applies to big-size auditors. Economic theories of product differentiation suggest that sellers expend their resources to build a reputation (Klein and Leffler, 1981; Shapiro, 1983). In the audit market, there are two levels of reputation development. The first level requires audit firms to invest in their brand name's reputation in order to differentiate the quality of their products. The

[22] Hartley and Ross investigate the perceptions of three groups of respondents on NAS, namely: auditors, financial analysts and management. Their results show that only 5.6% of the respondents rank the NAS provision as important threat to auditor independent. The overall findings suggest that that auditor independence *in fact* can be retained while providing NAS, but it is not essentially improved the auditor independence *in appearance*.

[23] For example, Lai and Krishnan (2009) findings suggest that when the firms purchase the related services of financial information system (FIS) from the external auditors, they are more likely to have higher market value of equity, suggesting that the FIS related services are been priced by investors as a value-added activity. Such belief shows that NAS increased the firm value, thus contribute to the efficiency and effectiveness of the overall firms' performance, despite raising a threat to auditor independence.

second level requires big-size auditors to actually differentiate the quality of their products among them. Due to the complexity and unique features of certain industries, buyers demand industry specialist auditors in order to deal with specific accounting rules and reporting requirements (Craswell et al., 1995). Such demands encourage big-size auditors to invest resources in a particular industry in order to gain industry specific knowledge and competency.

Evidence suggests that specific knowledge, task-specific experience and training increase an auditor’s competence (Ashton, 1991; Boner and Lewis, 1990) and results in auditors seizing increasing numbers of established audit clients in specific industries. The auditor market share rises as the number of their audit clients increases. The larger an auditor's market share is, the more likely clients are to perceive that that auditor would supply a higher quality audit. This notion is consistent with the studies that show that a firm’s market shares signals their product's quality (Smallwood and Conlisk, 1979; Shockley and Holt, 1983; Caminal and Vives, 1996).

The industry specific knowledge and competency that is possessed by an auditor represents the main component of their audit quality. Taylor (2000) and Low (2004) claim that an auditor’s knowledge of a clients’ specific industry affects the level of audit risk assessment and other audit-planning decisions. When auditors have a higher knowledge and a better understanding of the clients’ industries they are able to assess appropriately the levels of audit risk and to plan their audit strategies, and this can help them to anticipate the potential for misstatements

Evidence has also suggested that the possession of industry specialist knowledge improves auditor performance. Owhoso et al. (2002) examine the effectiveness of industry specialist auditors in detecting errors during the audit review process for two specific industries, namely banking and health care. Their findings suggest that the auditors’ experience in the specific industry enables them to detect error more effectively than non-specialist auditors. Auditors without specific industry experience perform below the nominal benchmark for error detection. Similarly, Bédard and Biggs (1991) show that the auditors who have greater manufacturing experience are better at detecting errors than the auditors who have less manufacturing experience.

Dunn and Mayhew (2004) find a positive relationship between industry specialist auditors and disclosure quality. Their findings suggest that auditors with specific industry knowledge are more able to assist their clients in developing industry specific disclosure strategies. O'Keefe at al. (1994) find that industry specialist auditors are associated with a higher compliance with GAAS reporting standards than non-specialist auditors. Carcello and Nagy (2004) report a negative relationship between industry specialist auditors and the incidence of fraudulent of financial reporting, and this indicates that industry specialist auditors are less likely to be associated with financial fraud.

Several studies have linked auditor industry specialists with earnings management (e.g. Balsam et al., 2003; Krishnan, 2003a). These studies report that the clients of industry specialist auditors experience lower discretionary accruals than the clients of non-specialist auditors. The findings suggest that industry specialist auditors are more likely to constrain earnings management and the opportunistic behaviour of management.

In other studies, concerning market reaction, Knechel et al. (2007) claim that when firms switch from a Big 4 non-specialist to a Big 4 specialist auditor, those firms experience a significant positive abnormal return. Subsequently, the markets react negatively when firms switch from a Big 4 specialist to a Big 4 non-specialist. These findings indicate that the market perceives audit quality differences based on industry specialization.

Beside the theoretical justification and empirical evidence for the connection between industry specialist auditors and audit quality, regulators and authoritative guidance have also emphasised the importance of an auditor being able to understand the client's industry setting before proceeding with auditing work (Knechel et al., 2007). For example, the UK Auditing Standard, ISA 300: *Planning an audit of financial statement* (ABP, 2004), states that an auditor needs to establish an understanding of the client's industry setting before planning their audit strategies.

In summary, most of the prior studies indicate that an auditor's industry knowledge is a crucial component in the efficiency and effectiveness of audit processes and that it increases the quality of auditing services. The use of an industry specialist auditor not only improves the quality of auditing work but is also perceived to be valuable to market participants.

3.4 The effectiveness of boards of directors

Fama and Jensen (1983) suggest that the board of directors is the highest-level of control mechanism in an organization because they possess the ultimate power to compensate the decisions that are made by the top management. Evidence suggests that several characteristics of a board may influence their effectiveness in their monitoring role. These characteristics are: size, composition of independent non-executive directors, financial expertise and meeting frequency.

3.4.1 Board of directors size

Board size is believed to be a fundamental aspect of effective decision making (UK Corporate Governance Code, 2010). Vafeas (2005) suggests that the size of a committee and the performance of the directors have a non-linear relationship. Both too small and too large a size of board is likely to make it ineffective. Lipton and Lorsch (1992), for example, recommend the ideal size for a board should not exceed eight or nine directors. Jensen (1993) claims that when a board has beyond seven or eight members, it is less effective due to the problems of coordination and process which, in turn, contribute to weak monitoring.

Although average board sizes are relatively large, prior studies have shown that smaller boards are more effective as directors can communicate better on them and they are easier to manage.[24] These factors promote a more resourceful conversation. For example, studies of board size and corporate performance have indicated that smaller boards are associated with higher market values. Yermark (1996) examines 452 large U.S firms in the period between 1984 and 1991 and he documents a negative relationship between board size and firm value. Drawing from Yermark's

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[24] Xie et al., (2003) and Vafeas (2005) report the average size of board in their samples are 12.48 and 11.6, respectively.

study, Eisenberg et al. (1998) also provide a similar conclusion on board size and firm value in a sample of small and mid-size Finnish firms.

In studies related to earning informativeness, Vafeas (2000) claims that market participants perceived the information content of earnings as being higher in the firms with a smaller board (with a minimum of five members). This is probably due to the commitment of each individual member and the likelihood of them accepting their responsibility as a personal obligation. By comparison, on a larger board, the responsibility of monitoring is divided among members and less responsibility is carried by each individual member (Vafeas, 2000).

With regard to audit quality studies, Abbott et al. (2004) suggest that the firms with smaller board size experience a lower incidence of restatements as the smaller boards contribute to effective communication and there is less likelihood of a communication breakdown. This suggests that when board members communicate effectively, they reduce the incidence of misunderstanding and consequent errors, and that they are more sensitive to the issues that may affect their shareholders or investors' confidence, particularly concerning financial reporting issues.

3.4.2 Independent board of directors

Non-executive directors are associated with the responsibility for monitoring managers and thereby reducing agency costs that arise from the separation of ownership and control in day-to-day company management (Fama, 1980; Fama and Jensen, 1983; Brennan and McDermott, 2004). The UK Corporate Governance Code (2010: 11) highlights that one of the main responsibilities of non-executive directors is to "satisfy themselves on the integrity of financial information and that financial controls and systems of risk management are robust and defensible". Thus, higher proportions of independent non-executive directors on boards are expected to induce a more effective monitoring function which then leads to more reliable financial statements. This is due to the incentive for independent board members to develop reputations as experts in decision making (Fama and Jensen, 1983) and to provide an unbiased assessment of a management's actions (Vance, 1983).

Prior studies indicate that an independent board is an effective monitoring safeguard. Beasley's (1996) study suggests that larger proportions of non-executive directors on boards tend to be negatively related to financial statement fraud. O'Sullivan (2000) and Carcello et al. (2002) document a positive relationship between the proportion of non-executive directors on a board and audit quality. This suggests that independent board members demand more in-depth audit efforts from the auditor, leading to a higher quality audit. Similarly, a stream of literature on earnings management and independent boards suggest that the firms with a higher percentage of independent board members encounter a lower incidence of earnings management (Klein, 2002; Davidson et al., 2005; Peasnell et al., 2005; Xie et al., 2002). In summary, all of these studies recognise the independent board as facilitating effective monitoring.

3.4.4 Board of directors expertise

Board of director knowledge and experience are important elements in ensuring the effectiveness of a board's monitoring function. Carcello et al. (2002) suggest that the members of boards of directors who have more experience in terms of a higher number of directorships are more likely to demand high-quality audit work. Further, Chtourou et al. (2001) claim that the directors with a higher tenure of board experience are less likely to be associated with earnings management. Both studies conclude that higher levels of board expertise lead to a higher monitoring incentive.

In addition, when the board of directors is financially literate they can understand and address issues relating to financial statements. Xie et al. (2003) find that earnings management is less likely to occur in firms that are run by a board of directors who have a corporate and financial background. Similarly, Agrawal and Chadha (2005) claim that the likelihood of earnings restatement is lower in firms whose boards of directors are financially literate. Evidence from auditor independence literature suggests that boards of directors with financial expertise tend to limit the NAS purchased from auditors as they believe that a provision of NAS compromises auditor independence (Lee, 2008).

In summary, all of these studies recognise that the boards of directors who have specific knowledge and experience are useful in monitoring both management and auditors. Since this thesis examine the audit quality and earnings management, the accounting and financial knowledge are beneficial to board of director to understand better the financial statements and issues related to financial reporting.

3.4.4 Board of directors meetings

One of the responsibilities of director is attending meeting and by doing so they would have privilege to vote on key decisions (Ronen and Yaari, 2008). Conger et al. (1998) suggest that more frequent board meetings improve a board's effectiveness. The meetings are a key dimension of board operations (Vafeas, 1999) and an indicator of the effort put in by the directors (Ronen and Yaari, 2008). Active boards that meet more frequently are more likely to perform their duties in accordance with shareholders' interests (Vafeas, 1999) and to put more effort into monitoring the integrity of financial reporting and thereby improving the audit quality.

Vafeas (1999) finds that a higher meeting frequency is a reaction to deteriorating performance. Xie et al. (2003) argue that a board that rarely meets may only have time for signing management plans and listening to presentations and, therefore, time to focus on issues such as earnings management will be limited. This shows that board activity affects performance and it is an important factor in constraining earnings management.

Carcello et al. (2002) and Krishnan and Visvanathan, (2009) suggest that a higher frequency of board meetings leads to higher audit fees, and this is consistent with the argument that when a board of directors meets more frequently, they demand an extensive audit effort from the auditor, which improves the quality of the audit process. In addition to this, Chen et al., (2006) examine the 169 firms under Chinese Securities Regulatory Commission (CSRC) enforcement actions between the period of 1999 to 2003. They suggest that the higher frequency of board meetings reduces the likelihood of fraud because regular meetings allow the directors to identify and resolve potential problems, particularly those that are related to the quality of financial reporting.

3.5 The effectiveness of audit committees

The audit committee is one of the committees that is established by the board of directors and whose main responsibility has to do with financial reporting. Apart from the benefit that is gained from the establishment of an audit committee, prior studies suggest that the size, composition, expertise and meeting frequency of audit committees may impact their monitoring effectiveness (e.g. DeZoort et al., 2002; Walker, 2004).

3.5.1 Audit committee size

According to the UK Corporate Governance Code (2010: 19), "the board should establish an audit committee of at least three independent non-executive directors." (C.3.1). It seems that the size is also one of the important characteristics that contribute to an audit committee's effectiveness.

Consistent with the argument for an effective committee size, too small a committee size may mean that an insufficient number of directors are able to serve the committee and thereby the effectiveness of monitoring is decreased (Vafeas, 2005). This is probably due to an individual director being unable to perform their duties efficiently as the committee's assignments are spread across a small number of directors. In addition to this, when a committee is too large, the performance of the directors may decline due to the problems of coordination and process and therefore this is identified as another cause for weak monitoring (Jensen, 1993; Vafeas, 2005).

The ideal average size of an audit committee is between 3 and 4 members (e.g. Vafeas, 2005; Xie et al., 2003; Abbott et al., 2004). Evidence from audit committee sizes suggests that firms with larger audit committees are more effective in monitoring management. Yang and Krishnan (2005) examine the relationship between audit committee size and quarterly earnings management in 896 US firms in the years 1996 to 2000. They find that quarterly earnings management is lower for firms that have a larger audit committee size.[25] This may suggest that having a sufficient number of audit committee members increases the efficiency of an audit committee's function in terms of monitoring the integrity of financial reporting.

[25] Yang and Krishnan (2005) report the mean, first quartiles, median and third quartile of audit committee size as 3.587, 3, 3 and 4, respectively.

In another study, Chen and Zhou (2007) find that the firms with larger audit committees are more concerned about their auditors' reputations and tend to assign the Big 4 auditors. In summary, the larger the size of the audit committee, the more effective they are in monitoring financial reporting.

3.5.2 Independent audit committee

Agency theory suggest that the independence of a non-executive director is an essential quality that contributes to a committee's effective monitoring function (Fama and Jensen, 1983) and that the empirical evidence on audit committee independence is consistent with this proposition. Several studies suggest that independent audit committees are less likely to be associated with financial statement fraud (Abbott et al., 2004; Abbott et al., 2000) and more likely to be associated with lower earnings management (Klein, 2002; Xie et al., 2003; Bédard et al., 2004; Davidson et al., 2005) and a lower incidence of earnings restatement (Agrawal and Chadha, 2005) . The independent audit committee is expected to provide unbiased assessment and judgement and to be able to monitor management effectively.

In addition, Carcello and Neal (2000) provide evidence of the relationship between audit committee independence and the disclosure choices of firms in financial distress. They suggest that firms with a higher percentage of independent audit committees are less likely to receive a going concern audit opinion from auditors. Further, Carcello and Neal (2003) suggest that independent audit committees are more effective in protecting auditors from dismissal following the issuance of a going-concern audit report.

In a study related to auditor quality, Abbott and Parker (2000) and Chen et al. (2005) suggest that having a higher proportion of independent non-executive directors in audit committees increases the tendency to assign industry-specialist auditors. In summary, all of these suggest that independent of audit committees are associated with a higher quality of financial reporting and that they can be regarded as effective monitors.

3.5.3 Audit committee expertise

According to the UK Corporate Governance Code (2010: 19), "the board should satisfy itself that at least one member of the audit committee has recent and relevant financial experience." DeZoort (1998: 17) argues that an audit committee member's experience in accounting and auditing is necessary for a sufficient understanding of oversight tasks. He suggests that:

> "…audit and internal control evaluation experience makes a difference in audit committee members' performance on an internal control oversight task. Of primary importance, audit committee members with experience made internal control judgements more like those of experts (i.e. practising auditors) in the area than did members without experience."

In other words, the regulatory concern and the experimental evidence suggests that having appropriate experience and knowledge, particularly in accounting and auditing, is likely to improve an audit committee's performance and judgement.

The empirical evidence from archival studies also suggests that the financial expertise of an audit committee improves its monitoring ability and results in an increase in the quality of a firms' financial reporting. Krishnan and Visvanathan (2008) examine the association between the financial expertise of audit committees and financial reporting quality, measured by the level of accounting conservatism, in a sample of 929 US firms from 2000 to 2002. They argue that, with financial expertise in accounting, audit committees can efficiently assess the nature and the appropriateness of accounting choices, constrain the aggressiveness of accounting policies and provide incentives to avoid the risk of litigation. Their findings suggest that audit committees with accounting financial expertise increased the overall audit committee's oversight function and thus they were more likely to promote accounting conservatism than the audit committees with non-accounting or non-financial expertise, particularly in an environment where the board of directors was strong.

Similarly, DeFond et al. (2005) find that market participants react positively to the appointment of an audit committee with financial expertise in accounting, but no reaction is noted for audit committees with non-accounting financial expertise.[26] This is due to the fact that the appointment of committee members with accounting financial expertise improves the oversight function of the committees and thus provides a credible signal to the investors that the firms aspire to a higher quality of financial reporting. In addition, DeFond et al. (2005) suggest that positive market reaction is concentrated on the firms that are relatively strong in corporate government. Both studies conclude that an audit committee with financial expertise complements a strong corporate governance environment by improving the board's ability to protect shareholder interests and increase their firm's value.

It has been suggested that an audit committee's financial expertise is associated with a higher quality of financial reporting (Carcello et al., 2002; Abbott et al., 2003a) and less likelihood of opportunistic earnings (Xie et al., 2003; Bédard et al., 2005). The reason for this is the financial knowledge and experience that improves an audit committee's oversight function and its ability to facilitate effectively the financial reporting process. Overall, the empirical evidence reviewed supports the proposition that the audit committee with financial expertise has improved their effective monitoring function.

3.5.4 Audit committee meeting

Several studies suggest that firms with a higher number of audit committee meetings experience less financial restatement (Abbott et al., 2004), are less likely to be sanctioned for fraud and aggressive accounting (Abbott et al., 2000; Beasley et al., 2000) and are associated with a lower incidence of earnings management (Xie et al., 2003). These studies suggest that audit committees who meet regularly during the financial year are linked to effective monitoring. The more frequently they meet, the more efficiently they discharge their oversight responsibilities.

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[26] DeFond et al. (2005) and Krishnan and Visvanathan (2008) measure the audit committee expertise in three ways: accounting financial experts (directors with experience as certified public accountant, controller or chief accounting officer), nonaccounting financial experts (director with experiences as chief executive officer or president) and nonfinancial experts (directors who are neither accounting nor nonaccounting financial experts).

In another study, Krishnan and Visvanathan, (2009) found a positive relationship between audit committee meetings and audit fees, suggesting that the firms with a higher number of audit committee meetings demand more assurance and a higher quality audit from their auditors. In order to provide more assurance and a higher quality audit, the auditors may need to perform additional audit work in terms of enlarging the scope of the audit and increasing the levels of audit testing, which results in both higher audit fees and a higher audit quality. Therefore, the higher the frequency of an audit committee's meetings, the more their monitoring function is improved.

3.6 Earnings management

According to Watt and Zimmerman (1990) and Fields et al. (2001), earnings management may derive from the flexibility of accounting choices that are given by GAAP. The GAAP allows managers to choose the appropriate reporting procedures and to make estimations and assumptions according to their business environment. Moreover, with an alternative on offer, the manager may choose the reporting procedure that could benefit and increase the wealth of all the contracting parties (Watt and Zimmerman, 1990). As a result, accounting choices may create the problem of earnings management.[27] Such a problem, for example, causes shareholders, investors and debt holders to be unable to distinguish the true economic value of a firm because their reports do not accurately reflect the actual performance of the firm.

Schipper (1989) defines earnings management "in the sense of purposeful intervention in the external financial reporting process, with the intent of obtaining some private gain". Healy and Wahlen (1999) claim that earnings management occurs when the managers use their judgement in preparing financial statements with the intention not to report the firm's actual economic performance or in order to gain benefit from the 'adjusted figure'. Consistent with this definition and description of earnings the present study views earnings management as the opportunistic behaviour of management.[28]

[27] As pointed out by Fields et al. (2001: 260), "not all accounting choices involve earnings management, and the term earnings management extends beyond accounting choice, the implications of accounting choice to achieve a goal are consistent with the idea of earnings management".

[28] The present study acknowledges that earnings management can also be regarded as beneficial information by the market. The managers may use earnings to communicate private information that

Managers engage in opportunistic earnings for several reasons such as for bonus compensation (Healy, 1985; Gaver at al., 1995; Holthausen et al., 1995), the avoidance of debt-covenant violation (Sweeney, 1994; DeFond and Jiambalvo, 1994), the prevention of earnings decreases and losses (Bugstahler and Dichev, 1997; Barth et al., 1999) and compensating for regulatory or political costs (Cahan, 1992; Jones, 1991; Han and Wang, 1998). Each of these motivations is now reviewed.

Agency theory suggests that one way to monitor an agent's behaviour is through their compensation contracts, enabling the interest between principal and agent to be perfectly aligned (Jensen and Meckling, 1976). Such contracts, for example, can be formed between shareholders and managers or as debt-covenants between managers and lenders. Since compensation contracts and debt-covenants are usually linked to an accounting number, such contracts create incentives for managers to manipulate earnings (Watt and Zimmerman, 1978).

Healy (1985) posits that managers tend to choose income-decreasing accruals when their bonus plans are binding at the maximum or minimum levels and income-increasing accruals when their bonus plans are not binding. She argues that when earnings are extremely low and cannot meet the earnings' target within the accounting procedures, the managers have incentives to further reduce current earnings in terms of differing revenues or accelerating write-offs and these approaches are referred to as "taking a bath" (Healy, 1985: 86). These actions, however, do not necessarily affect current bonus awards but may help to meet a future earnings target. In contrast, Gaver et al. (1995) find the managers select income-increasing accruals when the bonus plans are falling below the lower bound, and *vice-versa*. They claim that their results are more consistent with the income smoothing hypothesis that states that managers manipulate earnings in order to reduce the divergence of reported earnings and to

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could potentially maximise a firm's value (Watt and Zimmerman, 1986; Holthausen, 1990; Subramanyam, 1996; Sankar and Subramanyam, 2001; Arya et al. 2003; Louis and Robinson, 2005). However, since earnings management is involved a higher degree of managerial judgment, the auditors and boards of directors safeguard themselves by constraining earnings management activities. Thus, the present study concentrates on the negative aspect of earnings management.

ensure that the current earnings reach the normal or expected earnings target.[29] Holthausen et al. (1995) find similar findings to Healy (1985), but find no evidence that income-decreasing accruals are associated with a lower minimum boundary and claim that Healy's results may be sensitive to the particular model used to estimate discretionary accruals. In summary, these studies conclude that bonus scheme plans create incentives for managers to manipulate earnings in order to maximise their bonus award.

Sweeney (1994) examines a sample of firms prior the violation of accounting-based restrictions in debt agreements. She finds that when the managers of defaulting firms are approaching covenant violation they are more likely to report income-increasing accruals in order to offset their debt constraints. DeFond and Jiambalvo (1994) provide similar findings and they conclude that debt-covenants influence a manager's accounting decisions in the preceding year and during the year of the violation.

In general, market participants and stakeholders appear to reward the firms with positive or higher earnings more than the firms with negative or lower earnings, and therefore managers manipulate earnings to meet these expectations. Bugstahler and Dichev (1997) provide evidence that managers manipulate earnings in order to avoid earnings decreases and losses. Specifically, their results on the frequency of distributions in earnings show that there are low frequencies of small earnings decreases and small losses but that higher frequencies of small increases in earnings and small positive incomes are unusual. Barth et al. (1999) suggest that the firms with patterns of increasing earnings are more likely to have larger earnings multiples (e.g. higher coefficient of earnings).

In studies related to regulatory or political cost, Cahan (1992) finds that the managers of firms under anti-trust investigation report income-decreasing accruals during

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[29] Mosses (1987: 360) define income smoothing as "as an effort to reduce fluctuations in reported earnings. Researchers generally have agreed that smoothing involves the use of some device to reduce the divergence of reported earnings from an earnings number that is "normal" or expected" for the firm."

investigation years. Similarly, Jones (1991) suggests that managers tend to report income-decreasing accruals during the year of an application for import relief in order to obtain import relief benefits such as increases in tariff or reductions in quota. Han and Wang (1998) examine opportunistic earnings in two groups of firms: petroleum refining firms and the crude oil and natural gas firms during the 1990 Persian Gulf crisis. Their findings suggest that petroleum refining firms used income-decreasing accruals to mitigate the possibility of adverse political actions.

In summary, the motivations reviewed above may reflect opportunistic behaviour on the part of management. This evidence suggests that managers use their discretion to manipulate reported earnings, and thus the monitoring roles of the board of directors, the audit committee and the external auditors are required in order to constrain earnings manipulation behaviour.

3.7 Accruals-based measure of earnings management

There are several potential instruments can be employed by managers to manipulate earnings management. This includes the flexibility of accounting method, income smoothing and accrual accounting. Among others, the managements are more favour toward the accruals accounting due to low cost and difficult to observe (Young, 1999).

The accruals can be divided into two components: the discretionary accruals and non-discretionary accruals. The discretionary accruals also known as abnormal accrual or managed accruals, which always related to earnings manipulation. While, the non-discretionary accruals referred as normal accruals or non-managed accruals. These terms are used interchangeably in earnings management studies (Kang and Sivaramakrishnan, 1995).

McNichols (2000) identify three main measures of discretionary accruals in the prior literature. These include the aggregate accruals models, specific accruals models and the frequency distribution approach. Several models are introduced in relation to the aggregate accruals such as Healy's (1985) model, DeAngelo's (1986) model, Jones's (1991) model, the modified Jones model from Dechow et al. (1995) and the performance-adjusted discretionary accruals model by Kothari et al. (2005). The main differences between the models are how the researcher partitions the non-discretionary accruals component from the total accruals and their ability to accommodate changes in firm's economic condition. The Healy (1985) model and the DeAngelo (1986) model assumed that non-discretionary accruals are constant, and these restrictions are seen to be unrealistic because accounting accruals change in response to economic conditions (Kaplan, 1985). As an alternative, Jones' (1991) model, the modified Jones model by Dechow et al. (1995) and the performance-adjusted discretionary accruals by Kothari et al. (2005) controls the variations of non-discretionary accruals by taking into account the changes in total assets, revenues, receivables as well as the firm's performance (e.g. return on assets). In fact, the Jones (1991) and modified Jones models are recognised in the literature as the most powerful models for detecting earnings management (Dechow et al., 1995; Young, 1999).[30] However, the limitation of aggregate models is the risk of misspecification when they inefficiently isolate the discretionary component of total accruals.

In relation to specific accruals, the discretionary accruals are an estimate based on single accruals. Examples of specific accruals models include the residual provision for bad debt (McNichols and Wilson, 1988), the loss reserves of property and casualty insurers (Petroni, 1992), loan loss provisions (Wahlen, 1994; Collins et al., 1995; Beaver and Angel, 1996) and tax expenses (Philips et al., 2003). McNichols and Wilson (1988) claim that when specific accruals represent a small part of the discretionary component, they may fail to reflect earnings management in cases where other discretionary components are manipulated. Thus, stated differently, the aggregate accruals models give rise to more comprehensive research design in capturing the discretionary components.

The frequency distribution approach focuses on the behaviour of earnings where there is a specific intention (e.g. to avoid earnings decreases or losses) or certain thresholds (e.g. to report positive profits, sustain recent performance, and meet analysts' forecast). This approach was developed by Burgstahler and Dichev (1997) and

[30] Dechow et al. (995) evaluates the ability of the several alternative models such as Healy (1985), DeAngelo (1986), Jones (1991), modified Jones and the industry model. While, Young (1999) evaluates the Healy (1985), DeAngelo (1986), modified DeAngelo, Jones (1991) and modified Jones models.

Degeorge et al. (1999), respectively. McNichols (2002) claims that the distribution approach provides specific predictions related to which firms will manage earnings rather than merely measuring the magnitude of managers' opportunistic earnings. In other words, the frequency distribution approach cannot infer earnings management activities, which are the main concern of this thesis.

In summary, the designs of earnings management research are various and the advantage of each approach is relatively dependent on the research question. According to McNichols (2000: 333), if the aim of research is to examine the magnitude of earnings management, the aggregate approach is more appropriate because specific accruals are relevant to tests for the associations between specific accruals and hypothesised factors and this requires a researcher to model each accrual component according to the hypothesised factors. In addition, the findings of specific accruals are difficult to generalize when specific accruals are not sufficiently sensitive. On the other hand, the frequency distribution approach cannot be used to identify the magnitude or the level of opportunistic earnings. The aim of this thesis is to examine the relationship of effective boards, audit committees and auditor quality in constraining earnings management. Thus, the magnitude of earnings or the activity levels of management towards opportunistic earnings are a crucial component of the investigation. Therefore, for the purposes of this thesis, the aggregate approach is more appropriate when compared with the specific accruals approach and the frequency distribution approach. There are three models of aggregate accruals that will be employed: the cross-sectional Jones (1991) model, the cross-sectional modified Jones model and the performance adjusted discretionary accruals model. These models will be explained in Chapter four.

3.8 The relationship between board of directors, audit committee and demand for audit quality

The following section reviews prior studies that have examined the relationship of effective boards and audit committees to the various proxies of audit quality (e.g. engagement of Big-size auditors, industry specialist auditors, restatements, fraud, litigation against auditors, auditor tenure, the appropriateness of going concern audit opinion, audit fees and NAS fees). These studies suggest that several characteristics of boards and audit committees, reviewed in section 3.4 and 3.5, are linked with effective monitoring that enhances the overall quality of financial reporting, and particularly the quality of audit services.

Several studies suggest that boards of directors and audit committees may influence the selection of an external auditor (Knapp, 1991; Beasley and Petroni, 2000; Chen et al., 2005; Abbott and Parker, 2000; 2002). The selection criteria that are used are based on the skills and abilities of auditors in enhancing the audit process. Knapp (1991) examines the behaviour of audit committee members and their choice of external auditors. He claims that audit committees appear more likely to choose Big 8 auditors than non-Big 8 auditors because the Big 8 auditors are inclined to report any material misstatements that they discover during their auditing work. Moreover, he suggests that audit committee members perceive that during the early years of an audit engagement there is a gradual improvement in audit quality due to a 'learning curve effect'. However, audit committee members also tend to perceive that during the subsequent years of an auditor-client relationship the audit quality may progressively reduce because that relationship can impair an auditors' independence.

Abbott and Parker (2000), Beasley and Petroni (2001) and Chen et al. (2005) examine more specific characteristics of boards and audit committees with respect to the selection of industry specialist auditors. As far as the present study is concerned, these are the only studies in this area that are based on US and Australian samples. There is no study that examined UK firms. Industry specialist auditors are more desirable because they are more reliable than non-specialist auditors for detecting errors (Bédard and Biggs, 1991; Wright and Aright, 1997) and frauds (Johnson et al., 1991; Carcello and Nagy, 2004). Abbott and Parker (2000) investigate the proportion of independent non-executive directors on boards and audit committees as well as the audit committee meetings. They suggest that the audit committees with solely independent non-executive directors that meet at least twice a year are more likely to employ industry specialist auditors. They also report insignificant relationship exists between the proportion of independent non-executive directors on boards and the employment of industry specialist auditors. Using a more specific sample, Beasley and Petroni (2001) claim that the property-liability insurers that have a higher percentage of non-executive directors on their boards tend to employ industry specialist auditors.[31] Chen et al. (2005) investigate the characteristics of the boards and audit committees of the top 500 Australian firms. They suggest that an audit committee with a higher percentage of non-executive directors is more likely to employ industry specialist auditors. However, they find no significant relationship between the audit committee meetings and expertise and the employment of industry specialist auditors.

Abbott et al. (2004) claim that financial restatement may signal inefficiency of financial reporting because it indicates that auditors have failed to identify errors in prior financial statement. Such inefficiency can be regarded as being indicative of a lower quality of both financial reporting and auditing (Kinney et al., 2004). Abbott et al. (2004) suggest that audit committees with independent members that are active and have financial expertise are more efficient in monitoring the financial reporting process, and that this leads to fewer occurrences of financial restatement. Consistent with this evidence, Agrawal and Chadha (2005) find that boards or audit committees with independent directors who have financial expertise are also associated with a lower incidence of restated earnings.

With regard to fraud, Beasley (1996) suggests that smaller boards' size and higher proportion of non-executive directors on boards improve the boards' function in monitoring the top managements' behaviour, particularly in preventing the financial statement frauds.[32] However, her finding on the establishment of audit committee is not significantly related with the incident of fraud, contradicts to McMullen's finding. McMullen (1996) suggest that the establishment of audit committee encourages higher quality of financial reporting in term of fewer lawsuits for fraud, less quarterly

[31] The inconsistency of this finding with Abbott and Parker (2000) might be due to the different research design and variable definitions employed in the Beasley and Petroni (2001) study. Abbott et al. (2000) define industry specialist auditors based the three specific measurements that are employed in the Palmrose (1986), Craswell et al. (1995) and Dopuch and Simunic (1982) studies. These measurements are based on the audit clients' industry sales. Beasley and Petroni (2001) assigned indicators for dependent variables; value 2 if the auditors are both specialists and Big 6 auditors, value 1 if the auditors are non-specialist Big 6 auditors, and value 0 if the auditor is a non-Big 6 auditor.

[32] In her analysis, she also differentiates between grey directors (the non-executive directors who are related to management) and independent non-executive directors. Her results suggest that both variables (percentage of grey directors and percentage of non-executive directors) are significant and have a negative relationship with the occurrence of financial statement fraud. This evidence shows that the term 'independent' is insensitive to the definition of non-executive directors. The result for board size is presented in the supplemental analysis (Beasley, 1996).

earnings restatement, less SEC enforcement and less illegal action. In a similar area of study under the SEC enforcement samples, Dechow et al. (1996) claim that where the board of directors is dominated by the management, practising the dual role functions, CEO is also the founder of the firms, fewer representatives of outside block holders and no audit committee are more likely to engage in earnings manipulation. Using more audit committee variables, Abbott et al. (2000) suggest that audit committees which are comprised of solely independent non-executive directors and which meet at least twice a year encounter fewer fraudulent financial statements. This finding supports the effective role of independent non-executive directors as a key to the monitoring of the financial reporting and auditing process. Chen et al. (2006) examine the relationship between the board of directors' characteristics and financial fraud in China. They find that the firms with boards of directors that are comprised of a higher proportion of independent non-executive directors and that have a higher frequency of meetings are less likely to commit fraud. However their result for board size is insignificantly related with the incidence of fraud.

Carcello and Neal (2000) examine the relationship between the composition of audit committees and the likelihood of going-concern audit opinion in 223 firms that experienced financial distress during 1994. They suggest that the higher the number of affiliated directors (i.e. grey directors) in the audit committee, the lower the likelihood of auditors in issuing going-concern audit reports. These imply that the predomination of affiliated directors in the audit committees are able to influence auditors' decision to issue the audit opinion (i.e. instead of issuing a modified report, the auditor issues unmodified report) and to dismiss the auditors if they refuse to issue clean reports. They further suggest that the audit committees with greater independence, equipped with financial expertise and lower stockholding are more effective in sustaining the auditor against dismissal after the issuance of new going-concern audit reports (Carcello and Neal, 2003).

Prior studies on the relationship of boards of directors and audit committees to audit fees can be viewed from different perspectives. The demand-based perspective suggests that an effective board of directors and audit committee demands a higher quality audit and greater assurance from the external auditors in order to protect their own interests (Carcello et al., 2000). Specifically, Carcello et al. (2002: 369) claim that a board of directors may seek to purchase a differentially higher audit quality to obtain an enhanced assurance in order to protect their "reputation capital, avoid legal liability and promote the shareholder interests". From this perspective, a higher audit quality is indicated by higher audit fees, which are consistent with the extensive audit effort and audit time that is set by auditors while performing their services.

Consistent with agency theory in respect to the vigilant oversight function of non-executive directors, O'Sullivan (2000) claims that the firms with a higher percentage of non-executive directors on boards are more likely to incur higher audit fees.[33] In a similar vein, Carcello et al. (2002) examine the relationship between a board's composition, meetings and directorship, and the level of audit fees. Their findings suggest that firms with a higher percentage of independent non-executive directors[34], more frequent board meetings and higher number of multiple directorships tend to demand a higher quality audit and a higher level of assurance. They inferred the demand for different levels of audit quality through the choice of big-size auditors because the size of auditors indicates different levels of quality (DeAngelo, 1981). A higher level of assurance is measured by the audit effort; "additional audit works" that are "beyond the auditors' cost-minimizing level" may result in a higher level of assurance (Carcello et al., 2002: 369). In their additional analysis, Carcello et al. (2002) replace the board characteristics with audit committee characteristics (i.e. composition, meetings and expertise). Their results show that audit committee independence and audit committee expertise are positively related with audit fees. However, the result for audit committee meetings is insignificantly related with audit fees. They examine further by integrating both the characteristics of board and audit committee and find that the results for the board of directors remain unchanged but that none of the audit committee's characteristics are significantly related to audit fees. This may suggest that, when a board is present, the audit committee's function might reduce as there is an increase in monitoring by the board. One of the limitations

[33] He does not differentiate between the types of non-executive director.

[34] Carcello et al. (2002) differentiate the types of directors, i.e. the independent non-executive directors (non-management directors who are free from any interest) and grey directors (non-management directors who have an economic or personal interest in the firm). Their results suggest a significant positive relationship between audit fees and both types of directors (% of grey directors on board and % of independent non-executive directors on board at $p<0.01$ and $p<0.10$ respectively).

identified in Carcello et al. is that they did not consider the problem of endogeneity in their analysis.

In contradiction to the evidence that is reported by Carcello et al. (2002), Abbott et al. (2003a) claim that the presence of a board of directors and an audit committee that is comprised of solely independent non-executive directors and at least one member who is equipped with financial expertise is positively associated with audit fees.[35] They also report that the number of independent non-executive directors on board and the number of board meetings are positively related with audit fees. In another study, Krishnan and Visvanathan (2009) examine the characteristics of boards and audit committees and their relationship to audit fees for 801 firm-year observations in the S&P 500 between 2000 and 2002. They find that the firms with a larger board size and more frequent board meetings are associated with higher audit fees. They also suggest a positive relationship between audit committee meetings and audit fees.

As an alternative to a demand-based perspective, a supply-based perspective is based on the auditor's point of view. If auditors perceive that their client is surrounded by strong corporate governance, this may signal that the firm has effective internal control and this may reduce the auditor's risk assessment and decrease the audit fees.

In order to give an understanding of how an auditor assesses an overall audit risk, the present study will first explain the audit risk model. SAS 300: *Accounting and Internal Control Systems and Audit Risk Assessments* (AICPA, 1995), defines audit risk as "the risk that auditors may give an inappropriate audit opinion on financial statements". Similarly, the International Standard of Auditing, ISA (UK and Ireland) 200: *Overall Objective of the Independent Auditor and the Conduct of an Audit in*

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[35] Abbott et al. (2003) highlight that there are several possible explanations for why their results contradict the findings of Carcello et al. (2002). Firstly, Carcello et al. (2002) employed a survey method, which may have been exposed to the non-response bias. Secondly, with regard to the type of sample, Carcello et al. (2002) used *Fortune 1000* companies which are actually greater in number than the total population of SEC registrants. The size of firms used may account for the different findings. Lastly, the gap between the years of the samples (i.e. Carcello et. al used sample between April 1992 and March 1993, but Abbott used sample between February 2001 and June 2001) may strengthen the influence of the audit committee's role due to increased enforcement by regulators during the period between the studies, and this may result in dissimilar findings.

Accordance International Standards on Auditing (UK and Ireland), (ABP, 2009: 6) describe audit risk as "the risk that the auditor expresses an inappropriate audit opinion when the financial statements are materially misstated." An audit risk model contains the elements of inherent risk, control risk and detection risk. Inherent risk is the risk that is associated with error and misstatement that occurs at the entity, account balance and class of transaction level. Control risk is the risk that the accounting and internal control system of an entity is unable to prevent or detect errors in a timely manner. Detection risk is the risk that an auditor's substantive procedures fail to detect errors and misstatements. Both the inherent risk and the control risk will determine the detection risk. If an auditor assesses an inherent risk and control risk to be low then the level of detection risk may be higher, leading to lower level of substantive procedures. In summary, the assessment of inherent and control risks are central in determining overall audit procedures.

In respect to a client's internal control system, auditors assess the control procedure and the control environment. The control environment is determined by the overall "attitude, awareness and actions" of a board of directors and management regarding internal control and its importance to their organization, while control procedures are related to policies and procedures that have been established (AICPA, 1995). By holding the inherent risk constant and applying strong control procedures, it is possible for a positive control environment (strong board of directors and audit committee) to reduce both the control risk and the audit risk. Cohen et al., (2002: 579) point out:

> ... in the case where a client's governance structure has effectively implemented a strong monitoring as well as strong strategic perspective, there is the potential for both a more efficient (e.g. less extent of tests of details) and a more effective (greater assurance of the integrity of the financial statements) audit.

This may suggest that strong corporate governance promotes an effective internal control environment. An effective internal control, then leads to a less substantive test by an external audit and results in lower audit fees.

Several studies have indicated negative relationship between the characteristics of boards and audit committee with audit fees (for example Tsui et al., 2001; Boo and

Sharma, 2008; Krishnan and Visvanathan, 2009). Tsui et al. (2001) examine CEO duality roles and audit fees using 650 observations from Hong Kong firms. Their findings suggest that the firms that separate the roles of CEO and chairman tend to have lower audit fees, indicating that effective monitoring mechanisms are in place and that they have the effect of reducing control risk and audit effort. Drawing on the Tsui et al. (2001) framework, Krishnan and Visvanathan (2009) also suggest similar findings on CEO duality roles and audit committee expertise. As well as suggesting that a more effective monitoring role is served by separately functioning CEOs and chairmen, they also claim that auditors value an audit committee's accounting and financial expertise. The financial expertise of an audit committee reduces the firm's control risk, which in turn is reflected in less audit testing and lower audit fees. Their findings on audit committee expertise contradict the study done by Abbott et al. (2003a) that suggests a positive relationship between audit committee expertise and audit fees. They claim that Abbott et al. (2003a) use a broad definition of audit committee expertise that includes both accounting and non-accounting financial expertise. They define accounting financial expertise as the directors having experience as certified public accountants, auditors, chief financial officers or financial controllers. The direction of this variable was sensitive to such differences in the definitions of financial expertise.

Prior discussions assumed that demand-based and supply-based perspectives are mutually exclusive. However, there is also a possibility that both perspectives could coexist and that they are not mutually exclusive (Krishnan and Visvanathan, 2009). For example, when an effective audit committee demands to have a higher quality audit, it increases both the audit scope and the audit effort. Simultaneously, an increased effectiveness may also correspond to a strong internal control which is reflected in the auditor's assessment of audit risk (Krishnan and Visvanathan, 2009). Boo and Sharma (2008) claim that, from the demand-based perspective, the association between corporate governance and audit fees in regulated companies (i.e. financial and utilities companies) is weaker because industry specific regulators share their monitoring and overseeing roles with the external auditor. Thus, they demand less extensive audit work in the presence of regulatory oversight. From a supply-based perspective, auditors perceive that when regulators provide an additional oversight role their presence may decrease the audit risk, thus there is less need for audit testing, resulting in lower audit fees. They also find that having multiple directorships on boards or audit committees relates positively to audit fees by encouraging more audit effort, in order to protect reputational capital, and tends to result in higher audit fees (in the presence of regulators). Moreover, they claim that auditors perceive audit risk as being higher due to the time constraints of directors who serve on multiple boards and this also promotes the need for extra audit work. Goddard and Masters (2000) investigate two sets of UK data from 1994 to 1995. Their results show that, in 1994, firms with audit committees have higher audit fees, but the data from 1995 reveals that there is no significant difference in the level of audit fees between companies, with or without audit committees. This contradictory result may be due to the improvements in accounting systems and internal controls that were introduced by the regulators[36]. Similarly, O'Sullivan (1999) also finds that there is no evidence that a board of directors' and audit committee's attributes influence the level of audit fees.[37] He explains that such insignificant findings may be due to the effect of monitoring functions that offset increased audit efforts.

With regard to NAS fees, there are a very limited number of studies that have examined the relationship between NAS and board of director or audit committee effectiveness. To date there are only four studies that have investigated these issues, namely: Abbott et al. (2003b), Lee and Mande (2005), Lee (2008), Adelopo (2010) and Zaman et al. (2011). All of these are largely based on US firms. Abbott et al. (2003b) examine the 538 firms that filed with SEC between February 5, 2001 and March 15, 2001. Using the ratio of NAS fees to total audit fees, they suggest that the firms with audit committees that are solely independent and that meet at least four times a year are likely to limit the amount of NAS that are purchased as, in their view, the higher levels of NAS might potentially impair audit quality. In their further analysis, they find that audit committee expertise is insignificant with NAS fees ratio. Lee and Mande (2005) extend the Abbott et al. (2003b) study by modelling the audit and NAS functions simultaneously. They suggest that the firms with solely independent committee members who meet at least four times a year have lower rate

[36] The Cadbury Report (1992) applies to the annual reports of the years ending on or after 30 June 1993 for UK public listed companies.

[37] O'Sullivan (1999) uses the 1995 data. According to Goddard and Masters (2000), the year 1995 is a transition year, as the Cadbury Report (1992) started to take effect from the middle of 1994.

of NAS purchase. However, when they model the NAS fees simultaneously, none of the audit committee characteristics are significant. Lee (2008) jointly investigates board of director and audit committee characteristics along with changes in NAS fees ratios (changes in total NAS fees to total audit fees). He claims that an effective audit committee (consisting of solely independent members of whom at least one-third have financial expertise) and board of directors (at least half of whom are independent and more than the sample median of whom are financial experts) are likely to limit NAS purchased in order to enhance auditors' independence. However, these three studies do not consider the characteristics of the size of committees or the financial expertise of board members. Adelopo (2010) examines more a more comprehensive range of board and audit committee characteristics (except for the financial expertise of boards of directors) using a simultaneous equation of audit and NAS fees from the FTSE 350 in the periods of 2005 and 2006. He finds that the frequency of audit committee meetings and the levels of independence on boards are positively related to both audit fees and NAS fees. In addition, the results suggest the firms with larger board sizes are likely to have higher NAS fees but pay lower audit fees. Recently, Zaman et al. (2011) examine the association between the corporate governance quality, audit fees and NAS fees. The audit fees and NAs fees are measured by natural log of audit fees and NAS fees, respectively. They find that the larger firms with the effective audit committee are likely to purchase more NAS due to the complexity of their operations. Their study, however, do not control the size of board and financial literacy of the board' members.

Overall, the studies of the effects of various characteristics of boards and audit committees do show that they have a significant impact on audit quality. Most of these studies, however, are undertaken by US based researchers and the results could not be generalized due to there being different institutional settings, legal environments and auditor incentives in other countries. By utilising three measurements of audit quality (audit fees, NAS fees and the engagement of industry specialist auditors), part of this thesis examines the relationship of the characteristics of boards and audit committees (e.g. size, composition, financial expertise and meeting frequency) to audit quality. As far as the present study is concerned, there is no prior study that examines the relationship between corporate governance and industry specialist auditors in the UK. The prior studies that relate audit fees and NAS fees to corporate governance levels in UK are limited to the examination of several characteristics of board and audit committee (Collier and Gregory, 1996; O'Sullivan, 1999, 2000; O'Sullivan and Diacon, 2002; Adelopo, 2010; Zaman et al., 2011). None of these studies examine the financial expertise of board members that has been suggested by the US studies to improve the quality of financial reporting (Xie et al., 2003; Agrawal and Chadha, 2005). These potential gaps demand further investigation since UK firms are unique in terms of their voluntary governance system.

Consistent with the evidence and the theoretical bases for the measurement of audit quality that are provided under section 3.3.1 to 3.3.3, the present study views higher audit fees (Abbott et al., 2003a; Carcello et al., 2002; O'Sullivan, 2000)[38], lower NAS fees (Wines, 1994; Firth, 2002; Frankel et al. 2002; Raghunandan, 2003; Sharma and Sidhu, 2001; Larcker and Richardson, 2004), and the engagement of industry specialist auditors (Owhoso et al., 2002; Bédard and Biggs, 1991; O'Keefe at al., 1994; Carcello and Nagy, 2004) to be associated with a higher quality audit.

Based on the propositions of agency theory, concerning monitoring roles, and the evidence from prior literature, the present study posits that a board of directors with a smaller size, more independence, more financial expertise and more regular meetings is defined as an effective board. Similarly, an audit committee with more members, that is solely independent, that possess financial expertise and that meets frequently is also described as being effective. It is argued that the boards of directors and audit committees with these characteristics demand a higher quality audit in order to safeguard their capital reputation, to avoid legal exposure and to promote shareholders' interests. Below are the summaries of hypotheses stated in a form that uses audit fees, NAS fees and the engagement of industry specialist auditors as proxies for audit quality:

[38] Despite the proposition that higher audit fees are associated with a higher audit quality and are consistent with a more extensive audit effort and audit time, the present study is aware of the possibility that lower audit fees could also associated with a higher audit quality. A supply-based perspective suggests that if auditors perceive that their clients have strong corporate governance, this may signal that the firm is supported by effective internal controls which, in turn, may reduce the auditors' risk assessment and decrease the audit fees (Tsui et al. 2001; Boo and Sharma, 2008b; Krishnan and Visvanathan, 2009).

H_1: *There is a negative relationship between the board's size and audit fees.*

H_2: *There is a positive relationship between the board's size and NAS fees.*

H_3: *There is a negative relationship between the board's size and the engagement of industry specialist auditor*

H_4: *There is a positive relationship between the independent board and audit fees.*

H_5: *There is a negative relationship between the independent board and NAS fees.*

H_6: *There is a positive relationship between the independent board and the engagement of industry specialist auditor*

H_7: *There is a positive relationship between the board's financial expertise and audit fees.*

H_8: *There is a negative relationship between the board's financial expertise and NAS fees.*

H_9: *There is a positive relationship between the board's financial expertise and the engagement of industry specialist auditor*

H_{10}: *There is a positive relationship between the board's meeting frequency and audit fees.*

H_{11}: *There is a negative relationship between the board's meeting frequency and NAS fees.*

H_{12}: *There is a positive relationship between the board's meeting frequency and the engagement of industry specialist auditor*

H_{13}: *There is a positive relationship between the audit committee's size and audit fees.*

H_{14}: *There is a negative relationship between the audit committee's size and NAS fees.*

H_{15}: *There is a positive relationship between the audit committee's size and the engagement of industry specialist auditor*

H_{16}: *There is a positive relationship between the solely independent audit committee and audit fees.*

H_{17}: *There is a negative relationship between the solely independent audit committee and NAS fees.*

H_{18}: *There is a positive relationship between the solely independent audit committee and the engagement of industry specialist auditor*

H_{19}: *There is a positive relationship between the audit committee's financial expertise and audit fees.*

H_{20}: There is a negative relationship between the audit committee's financial expertise and NAS fees.

H_{21}: There is a positive relationship between the audit committee's financial expertise and the engagement of industry specialist auditor

H_{22}: There is a positive relationship between the audit committee's meeting frequency and audit fees.

H_{23}: There is a negative relationship between the audit committee's meeting frequency and NAS fees.

H_{24}: There is a positive relationship between the audit committee's meeting frequency and the engagement of industry specialist auditor

3.9 The relationship of board of directors, audit committee and auditor quality in constraining earnings management

An abundance of studies has examined the monitoring roles of board, audit committee and auditor quality and their effectiveness in constraining opportunistic earnings. These studies suggest that an effective board and audit committee and a higher quality auditor extend their monitoring functions to limit earnings management behaviour. The following are some of the key papers in this area.

As far as the present study is concerned, there are only six relevant studies that have been done in the UK. These studies are Peasnell et al. (2000; 2005), Ferguson et al. (2004), Antle et al. (2006), Kwon et al. (2007), Habbash et al. (2010), Sun et al. (2010) and Habbash (2010). Peasnell et al. (2000) examine the association between the size of board and the proportion of non-executive directors on a board with the incidence of earnings management in UK firms in pre- and post-Cadbury periods. They find no significant relationship between the number of non-executive directors on board and earnings management in pre-Cadbury periods, but the results for post-Cadbury periods suggest that there are fewer incidences of income-increasing accruals in order to avoid earnings losses or earnings decline when the board of a firm is comprised of a higher proportion of non-executive directors. The board size is insignificantly related with earnings management in pre- and post-Cadbury periods.

Peasnell et al. (2005) investigate the effect of the proportion of non-executive directors on boards, CEO duality and the establishment of audit committees on the likelihood of earnings management occurring. Their tests are conducted using UK data from the periods of 1993 to 1996 and they use discretionary accruals as a proxy for earnings management. They find that the firms with higher percentages of non-executive directors on board are associated with a lower incidence of income increasing discretionary accruals, particularly when pre-managed earnings fall below zero or are less than prior reported earnings. However, there is no evidence to suggest that CEO duality, board size or the presence of an audit committee have any effect on the incidence of earnings manipulation. Both Peasnell et al.'s studies do not consider endogeneity issues in their models.

Ferguson et al. (2004) provide evidence from UK data for the periods of 1996 to 1998. They examine the likelihood of firms being associated with earnings management activities (the firms that are criticized by financial analysts or investors or investigated by the Financial Reporting Review Panel due to alleged accounting irregularities and opportunistic accounting treatment, and the firms that restate their prior financial statements or make adjustments under FRS No. 12) and the absolute value of their discretionary accruals (using the modified Jones model) and their relationship to NAS. NAS are measured by the ratio of NAS fees to total fees, the natural log of NAS fees and the percentile rank of NAS fees by practice office. They find that NAS fees are positively related to earnings management.[39] This suggests that the increased economic bonding between client-auditor may make auditors less likely to constrain a management's opportunistic earnings behavior, and thus reduce the quality of financial reporting. In addition, they also find that none of the corporate governance characteristics (i.e. CEO duality roles and the percentage of non-executive directors on boards) are significantly related to earnings management.

Kwon et al. (2007) provide evidence from an international setting using data from 28 countries, including the UK, from 1993 to 2003.[40] Specifically, they examine how the country's legal system affects industry specialist auditors in respect to constraining

[39] Except for when they are measured by the likelihood of firms being subject to irregularities and opportunistic accounting treatments and by the percentile rank of NAS fees by practice office

[40] The 28 countries include Australia, Austria, Belgium, Brazil, Canada, Chile, Denmark, Finland, France, German, Hong Kong, Indonesia, Ireland, Italy, Korea, Malaysia, Mexico, The Netherlands, Norway, Philippines, Singapore, South Africa, Spain, Sweden, Switzerland, Taiwan, Thailand and the United Kingdom.

earnings management. They suggest that the use of industry specialist auditors is negatively related to discretionary accruals and positively related to the earnings response coefficient, and that the benefit of employing industry specialist auditors increases as a country's legal system becomes stronger.

Antle et al. (2006) provide evidence from US and UK data. They investigate the audit fees and NAS fees data from the UK from 1990 to 2004, while from the US data is from the year 2000. They find that higher NAS fees decreased discretionary accruals, suggesting that there is a knowledge spillover effect resulting from the joint provision of audit and NAS. Specifically, they employed the natural log of NAS fees as the measurement of auditor independence and the Jones (1991) model to detect earnings management. In relation to audit fees and earnings management, they find a positive relationship between audit fees and earnings management. They argue that higher audit fees may create a bias in the client-auditor relationship, thus inclining the auditor to allow opportunistic earnings behaviour. However, this study did not incorporate board and audit committee characteristics, which are also believed to influence the quality of reported earnings.

Habbash et al. (2010) examine the commitment of non-executive directors (i.e. composition, meetings and directors fees) and chairman independence, using a sample of 227 UK FTSE 350 firms for fiscal year 2005 and 2006. In addition, they also control the number of board meeting in their earnings management model. They find that the non-executive directors' commitment and chairman independence are important to constrain the opportunistic earnings. Sun et al. (2010) investigate the association between the corporate environmental disclosure and earnings management and the interaction effect of the corporate governance mechanisms (i.e. size of boards and audit committee meetings) on the relationship between earnings and corporate environmental disclosure. They find no significant evidence the corporate environmental disclosure to be linked with reduced earnings manipulation but suggest that the audit committee diligence affect the relationship between earnings and corporate environmental disclosure. Both studies, however, do not fully integrate the other effective characteristics of board and audit committee in their model specification.

Habbash (2010) examines more comprehensively the characteristics of corporate governance and auditor quality including the size, proportion of independent members, levels of financial expertise, number of meetings, audit fees, NAS fees and the use of industry specialist auditors in the data from FTSE 350 between 2003 and 2006. The audit fees are measured using the natural log of audit fees and the ratio of audit fees to total fees, while the NAS fees are defined as the natural log of NAS fees and the ratio of audit fees to total fees. The measurement of the use of industry specialist auditors is based on the market shares of audit fees and the number of audit clients in a specific industry. The analyses are undertaken using two separate earnings management models. In the first model, he examines the effect of board of director characteristics on earnings management. The results suggest a negative relationship of the size and the independence of boards to earnings management. In the second model, he investigates the effect of audit committee characteristics and external auditor variables on opportunistic earnings. He finds that the audit committees that are comprised of higher proportion of independent members and equipped with financial expertise are more likely to constrain earnings management. Moreover, the results suggest that firms that pay higher audit fees and lower NAS fees and that have employed industry specialist auditors are more likely to limit earnings manipulation behaviour.

Although Habbash (2010) examines relatively similar characteristics of board, audit committee and auditor quality variables to those being investigated in this thesis, he does not incorporate both board and audit committee characteristics in a single model. Prior studies suggest that the effectiveness of an audit committee is associated with the composition of the entire board, therefore the joint monitoring roles of boards and audit committees are likely to strengthen the firm’s corporate governance overall (Menon and William, 1994; Collier and Gregory, 1999; Cohen et al., 2002; Boo and Sharma, 2008). In addition, the segregation of tests on audit committee characteristics from those of board of director characteristics may result in an incomplete analysis of earnings management.

In a similar vein, Klein (2002) investigates the effect of independent boards and audit committees on earnings management using data from 692 US firms in the period between 1992 and 1993. Her findings suggest that independent boards and independent audit committees are effective in constraining opportunistic earnings. Xie et al. (2003) investigate more board and audit committee characteristics, including the level of CEO duality, board meeting frequency, the independence of board members, the level of expertise, board size, audit committee size, audit committee meeting frequency and audit committee expertise and independence in 282 US firms. They employ the Jones model and Teoh et al.'s (1998) model to detect earnings management. They find that the firms with boards and audit committees with more independent members, who are equipped with corporate or financial expertise, and who have frequent meetings, experience lower levels of discretionary accruals.

Bédard et al. (2004) examine the relationship between audit committee characteristics (e.g. size, independence, expertise and number of meetings) and earnings management in a sample of 300 US firms which consists of two subsamples: 200 firms with aggressive earnings management (100 firms with the largest positive and 100 firms with largest negative discretionary accruals) and the firms with the lowest levels of discretionary accruals around zero (50 positive and 50 negative). They find that financial expertise and the presence of solely independent audit committees are negatively related to the likelihood of aggressive earnings management. This is consistent with the arguments that these characteristics improve their oversight function in monitoring earnings management. The size and the meeting frequency of audit committees are not significantly related to aggressive earnings management.

Vafeas (2005) analyses the data of 252 US firms in between1994 and 2000 to examine several board of directors and audit committee characteristics on the quality of reported earnings. The poor earnings quality is surrogated by small earning increases and the negative earnings avoidance. Evidence suggests that the small earnings increases are associated to the audit committee with insiders' directors, audit committee with director who are business executive and less frequent of audit committee meeting. While the results from the model of negative earnings avoidance suggest no significant relationship between the likelihood of avoiding negative earnings and the board and audit committee characteristics.[41]

[41] Specifically, Vafeas (2005: 1104) examines audit committee characteristics such as the percentage of committee insiders, percentage of active business executives, percentage of members with other audit committee experience, audit committee size, audit committee meeting frequency, median stock

Chtourou et al. (2001) examine the effect of board and audit committee characteristics (e.g. board size, board independence, board expertise, the presence of multiple directorships and director's tenure, CEO duality, the presence of independent nomination committees or solely independent audit committees, audit committee expertise and audit committee meeting frequency) and the Big 6 auditors on the extent of earning management in US firms. Their results suggest that audit committees with a higher percentage of independent members, solely independent and meet at least twice a year indicate a lower incidence of income-increasing accruals, while audit committees with financial expertise reduce the incidence of income-decreasing accruals. In addition, the results also suggest less likelihood of income-increasing accruals when firms have a higher proportion of independent members and less likelihood of income-decreasing accruals when the boards are larger in size and when the board members are equipped with board' experience. However, no evidence suggests that the employment of a Big 6 auditor constrains earnings management activities.

In contradiction to Chtourou et al.'s study on the impact of Big 6 auditors on earnings management, Becker et al. (1998) suggest that the firms with Big 6 auditors are more likely to report lower discretionary accruals than the firms with non-Big 6 auditors, and this is consistent with the argument that the Big 6 auditors provide higher quality audits and thus are more likely to constrain opportunistic earnings. Francis et al. (1999) suggest that the firms with a greater tendency for accruals are more likely to hire the Big 6 auditors as a credible signal to outsiders that they are less likely to manipulate earnings. They further argue that, even though their results suggest that the firms with Big 6 auditors have relatively higher levels of total accruals, they are less likely to be associated with higher discretionary accruals.

Krishnan (2003b) investigates the pricing of discretionary accruals of firms audited by Big 6 versus non-Big 6 auditors. His findings suggest that the relationship between stock returns and discretionary accruals are stronger for the firms that are audited by

ownership of committee members, mean tenure per committee member, mean directorships per committee member and mean committee memberships per committee member. For board of director characteristics, the percentage of outsider directors and board size is included.

Big 6 auditors as compared to those using non-Big 6 auditors. This supports the argument that Big 6 auditors improve the credibility of reported accruals. He also claims that the association between discretionary accruals and future profitability is greater for firms with Big 6 auditors, suggesting that the Big 6 auditors enhance the ability of discretionary accruals to predict future profitability. Kim et al. (2003) examine the direction of discretionary accruals and the selection of Big 6 auditors. They suggest that the Big 6 auditors are more effective in constraining income increasing accruals but less effective in constraining income decreasing accruals.

In respect to industry specialist auditors and earnings management, Krishnan (2003a) investigates 4,422 US firms, audited by Big 6 auditors, in between 1989 and 1998. The use of industry specialist auditors is measured using market share and portfolio shares approaches. The cross-sectional Jones model is employed to detect earnings management. He suggests that the firms with industry specialist auditors are more efficient in mitigating opportunistic earnings than the firms with non-specialist auditors. Balsam et al. (2003) examine 19,091 US firms at the financial year-ends for 1991 to 1999. They suggest that the levels of discretionary accruals are lower and that earnings response coefficients are higher for the firms with industry specialist auditors (and *vice-versa*).

Frankel et al. (2002) examine data from 3,074 proxy statements files with SEC between 5, 2001 and June 15, 2001. They employ three measures of auditor independence: the ratio of NAS fees to total fees; the percentile rank of audit fees and NAS fees disaggregated by auditor; and the percentile rank of the sum total of audit and NAS fees. The level of earnings management is estimated using the propensity to just meet or beat earnings benchmarks, and the cross-sectional modified Jones model is used to estimate the levels of discretionary accruals. They find that the firms with a higher NAS fee ratio and a higher percentile rank of NAS fees are more likely to meet or beat earnings benchmarks and report higher discretionary accruals. These results are robust to alternative earnings management measures such as discretionary total accruals, discretionary working capital accruals, performance-matched discretionary accruals and also being applicable to the samples of income-increasing and income-decreasing discretionary accruals.

In addition to their primary analysis of NAS fees, Frankel et al. (2002) also find that firms with higher audit fees (measured by the percentile rank of audit fees) are likely to have lower earnings management. This result supports the argument that higher audit fees may probably increase the number of audit hours, resulting in higher audit efforts (Deis and Giroux, 1996). It seems that higher auditor efforts may compensate for illegal behavior, including earnings manipulation, because management are more worried that such action may be discovered by the auditors. In agreement with this proposition, Caramanis and Lennox (2007) find that audit hours are negatively related to income-increasing discretionary accruals to meet earnings benchmarks. They conclude that a low audit effort increases the likelihood of a manager manipulating reported earnings.

Ashbaugh et al. (2003) replicated Frankel et al.'s (2002) study using similar datasets and tests. Specifically, they measure auditor independence using (1) the natural log of audit fees, (2) the natural log of NAS fees, (3) the natural log of the sum of audit and NAF fees and (4) the ratio of NAS fees to total fee. Earnings management is measured using the models of performance-adjusted discretionary accruals (using the portfolio technique and adding the *ROA* variable in the discretionary accrual regression) and the earnings benchmark. Their findings are relatively similar to those reported in Frankel et al.'s study except that they find no evidence that associates income-increasing discretionary accruals with the NAS fees ratio when performance-adjusted measures are employed.

In other studies, Chung and Kallapur (2003) investigate a sample of 1,871 US firms, audited by Big 5 auditors. They measure auditor independence as a ratio of the total fees (audit and NAS fees) to the audit firm's US revenues. The discretionary accruals are estimated using Jones' model. Their results fail to find any significant relationship between NAS fees and discretionary accruals. In a similar vein, Ruddock et al. (2006) examine the relationship between NAS and earnings conservatism. They also find no evidence that higher levels of NAS are associated with reduced conservatism.

Larker and Richardson (2004) provide mixed results on the relationship between NAS fees and earnings management. Consistent with Frankel et al. (2002) they find a positive relationship between the ratio of NAS fees to total fees and earnings management. Using other NAS fee measurements, they find that the firms with the higher levels of audit and NAS fees are likely to have lower earnings management. In their study, the auditor independence is measured using the ratio of NAS to total fees, the NAS fees, the sum of audit and NAS fees and the abnormal fees measurement. The cross-sectional Jones and modified Jones models are used to detect earnings management. They conclude that the monitoring roles of auditors are dependent on a firm's corporate governance structures.

Based on a test of 434 listed Australian firms, Davidson et al. (2005) argue that the strength of internal governance mechanisms (e.g. board of directors, audit committee, internal audit and external auditor) shapes the practice of earnings management. They find that having an independent board, CEO duality and an independent audit committee are significantly and negatively related to reduce levels of earnings management. However, there is no evidence that internal audits, audit committee size, audit committee meeting frequency and use of a Big 5 auditor are associated with the level of earnings management.

Osma and Noguer (2007) document evidence from Spain on the monitoring effectiveness of a board and its committees in relation to earnings management. Specifically, they examine the existence of institutional directors, independent boards, independent boards with financial expertise and independent audit committees and independent nomination committees. Their findings suggest that the institutional directors is negatively related to earnings management and that there is no evidence to support that the boards and it committees are associated with earnings manipulation. This contrasts with prior evidence documented in the US, UK and Australia. These results suggest that institutional directors are more effective in constraining earnings management practices than boards and their committees.

Park and Shin (2004) investigate the monitoring roles of boards and the practice of earnings management in Canada. In similarity to Osma and Noguer (2007), their results suggest that financial intermediaries and institutional directors play a major role in constraining earnings manipulation and that there is no significant evidence that outside directors and their tenures are associated with the incidence of earnings management.

Overall, the results on the relationships of corporate governance characteristics and auditor variables to constraining earnings management suggest mixed findings. Failure to control corporate governance variables or auditor variables in a single model may explain the conflicting results in prior studies as being due to incomplete analyses of earnings quality determinants and the monitoring role of auditors, which vary depending the strength of the client's corporate governance (Larcker and Richardson (2004). Therefore, in this thesis, the investigation of corporate governance characteristics and earnings management will incorporate auditor variables in order to avoid this misspecification.

The evidence reviewed suggests that an effective board and audit committee and a higher auditor quality are associated with a greater extent of monitoring functions, and are thus likely to constrain opportunistic earnings. In conjunction with the evidence from the prior literature and the arguments developed under Section 3.4 and 3.5 regarding the effectiveness of boards and audit committees, the present study hypothesizes that boards of directors which are smaller in size, have more independent members, possess financial expertise and have more frequent board meetings, as well as audit committees which are larger in size, solely independent, equipped with financial expertise and meet frequently, all lead to more effective monitoring. These characteristics of board and audit committee are expected to constrain opportunistic earnings. Stated differently, the present study tests the following hypotheses:

H_{25}: *There is a positive relationship between the board's size and earnings management.*

H_{26}: *There is a negative relationship between the independent board and earnings management.*

H_{27}: *There is a negative relationship between the board's financial expertise and earnings management.*

H_{28}: *There is a negative relationship between the board's meeting frequency and earnings management.*

H_{29}: *There is a negative relationship between the audit committee's size and earnings management.*

H_{30}: *There is a negative relationship between the solely independent audit committee and earnings management.*

H_{31}: *There is a negative relationship between the audit committee's financial expertise and earnings management.*

H_{32}: *There is a negative relationship between the audit committee's meeting frequency and earnings management.*

Similarly, consistent with the evidence reviewed and the theoretical proposition of auditors' quality differentiation, the present study argues that the effectiveness of audit services varies among auditors. The higher quality auditors are expected to detect earnings management and questionable accounting practices better than the lower quality auditors. In this thesis, the higher quality of auditors is associated with higher audit fees, lower NAS fees and the engagement of industry specialist auditors. These expectations lead to the following hypotheses:

H_{33}: *There is a negative relationship between audit fees and earnings management.*

H_{34}: *There is a positive relationship between NAS fees and earnings management.*

H_{35}: *There is a negative relationship between industry specialist auditor and earnings management.*

3.10 Summary

In this thesis audit quality is defined as the technical ability of an auditor to detect errors and their objectivity in reporting the discovered errors. Prior literature recognises several proxies to measure audit quality including audit fees, NAS fees and the use of industry specialist auditors. Consistent with the signalling or reputation hypothesis, higher audit fees and the engagement of industry specialist auditors are associated with higher auditor quality. While, the lower NAS is regarded as lower auditor quality due to the scepticism of the regulators and the investors that higher NAS could compromise the auditor independence. Evidence from prior studies suggests that the boards of directors which are smaller in size, have more independent directors, are equipped with financial expertise and meet more frequently are effective in their monitoring role. Similarly, audit committees with more members, sole independence, more financial expertise and that are more active are suggested to have a higher oversight function. Therefore, consistent with agency theory proposition and prior empirical evidence, the present study hypothesises that these effective characteristics of boards and audit committees are associated with a higher audit quality. In regard to earnings management, this thesis views earnings management as opportunistic earnings. The present study argues that the firms with effective characteristics of board and audit committee and higher quality auditors are less likely to allow earnings management because opportunistic earnings cause uncertainty about the economic value of a firm. Table 3.3 provides the summary of the key literature covered in this chapter.

Table 3.1: Summary of the key literature relating to board of directors, audit committee, audit quality and earnings management studies					
Author(s)	Sample	Country	Audit quality related proxy(s) and earnings management/ Dependent variable	Board of directors (BOD) and audit committee (AC) characteristics/ Independent variable(s)	Results
Abbott et al. (2003a)	492 non- regulated firm and audited by Big-5 auditors that filed proxy statement with SEC in the period February 5, 2001 to June 30, 2001.	US	Audit fees	BOD – composition, multiple directorship AC – composition, expertise, meeting	Higher audit fees are associated with: 1.solely independent non-executive directors in audit committee 2.at least one member of audit committee equipped with accounting or financial expertise 3. higher board meeting frequency 4. higher percentage of independent non-executive directors on board The audit committee meeting frequency and board's expertise are not significantly correlated with audit fees.
Carcello et al. (2002)	258 firms from *Fortune 1000* for fiscal year ended between April 1992 and March 1993.	US	Audit fees	BOD – composition, expertise, meeting AC – composition, expertise, meeting	The firms with the higher percentage of independent non-executive directors on boards, more expertise (multiple directorships) and higher board meeting frequencies are likely to have higher audit fees. When they replace the board attributes with audit committee attributes (i.e. composition, meeting frequency and expertise), their results show a positive relationship of audit committee independence and audit committee expertise to audit fees. The audit committee meeting frequency is not significantly related with audit fees. However, once they analyse board and audit committee attributes together, the results for the board of directors remain unchanged but none of the audit committee attributes are significantly related to audit fees.

Table 3.1 (continued)					
Collier and Gregory (1996)	315 firms for year 1991 (Financial Times All Share Index)	UK	Audit fees	AC – establishment	The firms with the presence of an audit committee are likely to have higher audit fees.
Tsui et al. (2001)	650 firms from 1994 to 1996	Hong Kong	Audit fees	BOD – duality roles	The firms that separate the functions of CEO and chairman roles are more likely to have lower audit fees, indicating effective monitoring mechanisms are in place, thus reducing the control risk and audit effort.
Boo and Sharma, (2008)	469 firms with total assets exceed $US 1bilion in fiscal year 2001	US	Audit fees	BOD/AC – size, composition, expertise, meeting	The associations of the board/audit committee independence and board/audit committee size to audit fees are weaker for regulated firms than for non-regulated firms except in the case of board/audit committee directorships.
O'Sullivan (2000)	402 UK large firms in 1992	UK	Audit fees	BOD – composition, ownership	The firms with the higher percentage of non-executive directors on board are more likely to incur higher audit fees, indicating a higher audit quality. He also claims that there is a negative relationship between executive ownership and audit fees.
O'Sullivan (1999)	146 UK large firms in 1995	UK	Audit fees	BOD – composition, tenure, duality roles AC – size, composition	There is no evidence that the board of director or audit committee attributes influence the level of audit fees.
O'Sullivan and Diacon (2002)	117 insurance companies in 1992	UK	Audit fees	BOD – composition, duality, ownership AC – establishment, composition	The existence of an audit committee has a positive relationship with audit fees but the audit committee composition as well as the board characteristics has no significant relationship with audit fees.

Table 3.1 (continued)					
Krishnan and Visvanathan, (2009)	801 listed on the S&P 500 for 2000 to 2002, audited by Big 5 auditors.	US	Audit fees	BOD – size, composition, meeting, duality roles, voting control, ownership AC – composition, expertise, meetings	The firms with separated dual roles functions and audit committees equipped with financial expertise are perceived by auditors to have a strong internal control environment, thus reducing the control risk and audit effort and leading to lower audit fees. Board and audit committee meetings have a positive relationship with audit fees.
Abbott et al. (2003b)	538 firms that filed with SEC between February 5, 2001 and March 15, 2001	US	Non-audit fees (ratio non-audit fees to total fees)	AC – composition, meeting BOD – ownership structure	The firms that have audit committees that consist of solely independent non-executive directors and meet at least four times a year are likely to have a lower NAS fees ratio.
Lee and Mande (2005)	780 firms for fiscal year 2000, S&P Super 1500	US	Non-Audit fees	AC – composition, expertise, meeting	The audit committees that are comprised of solely independent non-executive directors and that meet at least four times a year are likely to limit the purchase of NAS. However, once they model the NAS endogenously, such relationships are insignificant.
Lee (2008)	631 firms for fiscal year 2000 to 2001, S&P Super 1500	US	Changes in non-audit fees ratio	BOD – expertise AC – composition, expertise	The independence and expertise of audit committees and boards of directors are likely to limit the level of NAS purchased.
Beasley and Petroni (2001)	681 property-liability insurers during 1991 to 1992	US	Industry specialist auditor	BOD - composition	The insurers with the higher percentage of non-executive directors are more likely to employ an industry specialist auditor.

Table 3.1 (continued)					
Chen et al. (2005)	510 top firms listed on the ASX in 2000	Australia	Industry specialist auditor	BOD – multiple directorship AC – composition, expertise, meetings	The firms with a higher percentage of non-executive directors on their audit committees are more likely to employ industry specialist auditors. Audit committee expertise and the number of meetings are not significantly related to the engagement of industry specialist auditors. The results for board directorships are mixed.
Abbott and Parker (2000)	500 firms listed on the NYSE, AMEX or NASDAQ exchanges in 1994	US	Industry specialist auditor	BOD – composition, ownership AC – composition, meeting	The firms with audit committees that are solely comprised of independent non-executive directors and that meet twice a year are more likely to employ industry specialist auditors. The percentage of non-executive directors on boards is not significantly related to the engagement of industry specialist auditor across all measurements.
Dechow et al. (1996)	92 firms that subject to the SEC enforcement action between 1982 and 1992.	US	Earnings management: discretionary accruals	BOD – composition, ownership, duality roles AC – establishment	Where a firm's board of directors is dominated by the management, members practice dual role functions, the CEO is also the founder of the firm, there are fewer representatives of outside block holders and there is no audit committee formation there is more likelihood of earnings manipulation.
Klein (2002)	692 firms-years listed on the S&P 500 for 1992 to 1993	US	Earnings management : absolute value of discretionary accruals	BOD – composition, ownership AC – composition	Higher percentages of independent non-executive directors on audit committee and on board are associated with lower earnings management. However, there is no significant relationship between solely independent non-executive directors and earnings management.

Table 3.1 (continued)					
Xie at al (2003)	282 firms-years listed on the S&P 500 for 1992, 1994 and 1996	US	Earnings management: current discretionary accruals	BOD – duality roles, meetings, composition, size, expertise AC – size, composition, expertise, meeting	Earnings management is less likely to occur in firms whose board and audit committee are equipped with a corporate and financial background and have a higher percentage of independent non-executive directors as well as higher number of meetings.
Bédard et al. (2004)	200 firms (aggressive earnings management-highest and lowest income increasing/ decreasing), Compustat in 1996	US	Earnings management: discretionary accruals	BOD – multiple directorship, composition, ownership AC – composition, expertise, size, meeting	The firms with solely independent audit committees that are also equipped with financial expertise are less likely to have aggressive earnings management. There is no significant relationship of audit committee size and the number of meeting to earnings management.
Davidson et al. (2005)	434 listed Australian firms for financial year ending 2000	Australia	Earnings management: absolute value of discretionary accruals	BOD – composition, duality roles AC – composition, size, meeting	Firms with a majority of independent non-executive directors on boards and with solely independent audit committees are associated with lower earnings management.
Peasnell et al. (2005)	1,271 firms for fiscal year 1993 to 1995	UK	Earnings management: discretionary accruals	BOD – size, composition, ownership, duality roles AC - establishment	Firms with a higher percentage of non-executive directors on board are associated with lower income-increasing earnings management. However, there is no evidence that the presence of an audit committee affects the extent of income-increasing earnings management.
Park and Shin (2004)	539 firm-year for 1991 to 1997	Canada	Earnings management: discretionary accruals	BOD – composition, ownership	There is no significant relationship between the number of non-executive directors on board and earnings management. However, the representatives of active institutional shareholders reduce earnings management.

Table 3.1 (continued)					
Agrawal and Chadha (2005)	159 matched-pair of public firms that restated earnings in 200 and 2001	US	Restatement of earnings	BOD – composition, expertise, ownership, duality roles AC – composition, expertise	The likelihood of earnings restatement is lower in the companies whose board or audit committee has independent non-executive directors with financial expertise, but it is higher in companies in which the CEO belongs to the founding family.
Carcello and Neal (2000)	223 financial distressed firms during 1994	US	Modified audit report	AC – size, composition	The higher the percentage of independent non-executive directors on audit committees, the lower the likelihood of the firms to receive a going-concern audit opinion. The audit committee size is not correlated with the likelihood of a going-concern audit report.
McMullen (1996)	219 of firms consist of firms that associates to the litigation, earnings restatement, SEC actions, illegal acts and auditor turnover with disagreement	US	Financial reporting consequences- Litigation, earnings restatement, SEC actions, Illegal Acts, Auditor turnover	AC - establishment	The existence of an audit committee is associated with fewer lawsuits for fraud, fewer quarterly earnings restatements, fewer SEC enforcement actions, fewer illegal acts and fewer auditor turnovers that are related to disagreements.
Chen et al. (2006)	169 firms under the Chinese Securities Regulatory Commission (CSRC) enforcement actions during 1999 to 2003.	China	Fraud and non-fraud firms: coded 1 if the firm is subject to an enforcement action statement, 0 otherwise	BOD- size, composition, meetings, duality roles, chairman tenure, ownership	The firms with the lower percentage of non-executive directors on board, lower board meeting frequencies, and shorter chairman tenures are associated with a higher likelihood of the incidence of fraud.

Table 3.1 (continued)					
Abbott et al. (2004)	1. match-paired of 88 restatement sample firms from 1991 to 1999 2. 44 fraud firms under the SEC sanctions	US	1.Restatement 2.Fraud and non-fraud firms	BOD – size, composition, ownership, duality roles AC – size, composition, expertise, meeting	The firms with audit committees that are solely independent, meet frequently and that possess at least one member with financial expertise are less likely to experience restatement. A larger board size is associated to a higher likelihood of restatements. Audit committee expertise and independence are negatively related to the incidence of fraud.
Abbott et al. (2000)	156 firms: 78 firms subject to SEC' sanction matched with 78 non-sanctioned firms	US	Sanctioned and non-sanctioned firms: coded 1 if the firm is alleged to have SEC sanction, 0 otherwise	BOD – composition, ownership, duality roles AC – composition, meeting	The firms with audit committees that are comprised of solely independent members and that meet twice a year are less likely to be sanctioned for fraud and aggressive accounting. Having a CEO who also chairs the board is associated with a higher likelihood of sanction.
Beasley (1996)	150 firms: Matched-pair of 75 fraud and 75 non-fraud firms (SEC and Wall Street Journal Index)	US	Fraud and non-fraud firms: coded 1 if the firm is alleged to have fraudulent financial statement, 0 otherwise	BOD – composition, ownership, duality roles	Non-fraud firms are likely to experience lower levels of fraudulent financial reporting when the board has higher percentage of independent non-executive directors as compared with fraud firms. The board's composition rather than audit committee's presence is more important in reducing fraudulent financial reporting.

CHAPTER 4
METHODOLOGY

4.1 Introduction

This chapter presents the methodology used to test the hypotheses outlined in Chapter 3. The first section explains and justifies the sample firms selected and the time period during which the investigation was carried out. The chapter then outlines the definitions and measurements of the hypothesis variables (i.e. the effective characteristics of board and audit committee, audit quality proxies and earnings management). The model specifications and related control variables, the sources of data and the data analysis procedures are also discussed. Finally, a summary of the chapter's contents is also provided.

4.2 Sample firms and period of study

The sample population for this study is the Financial Times Stock Exchange (FTSE hereafter) 350, which consists of FTSE 100 and FTSE 200, representing the largest 350 firms by market capitalisation listed on the London Stock Exchange (LSE). These firms are selected because they include a broad range of industrial and commercial activities and account for a significant portion of the UK economic output.

The main focus of this thesis is to examine the effectiveness of the board of directors and audit committee in terms of corporate governance best practice, as outlined in the UK Corporate Governance Code (2010). Since some of the Code's provisions do not apply to the firms below the FTSE 350, the FTSE 350 firms provide an ideal sample to investigate (The UK Corporate Governance Code, 2010: 5).

The study examines a sample period of the fiscal years 2005 and 2008, following an event believed to have significant influence on this study. The event in question is the revision of the UK Corporate Governance Code, which was introduced in July 2003 based on the recommendations set out in the Higgs and Smith reports, and which came into effect on 1 November 2003 for all UK listed firms. The Higgs Report provides a review of the role and the effectiveness of non-executive directors, while the Smith Report details the role of the audit committee. Allowing for a year's transition period, the present study examines the fiscal period of 2005 to 2008 to ensure that all FTSE 350 firms meet the new requirements.

4.2.1 Sample selection for regression analysis

The initial sample of the FTSE 350 consists of 1,400 firm-year observations for the period 2005 to 2008. However, the present study excludes 504 firms that operate in the financial and utilities sectors, due to their unique characteristics and to specific regulations which may affect the results. The sample size has also been reduced by a further 168 firm-year observations as a result of missing information in *Datastream*, *FAME* and *Thomson One Banker*. Another 49 firm-year observations have been eliminated, since their annual reports were unavailable, as have another 5 firms which were not audited by Big 4 auditors in order to control for brand name (Craswell et al., 1995; Chung and Kallapur, 2003). After the eliminations, the remaining sample is of 674 firm-year observations. The sample selection procedure is summarised in Table 4.1.

Table 4.1: Sample selection procedures

Description	2005	2006	2007	2008	Pooled
Initial sample (FTSE 350)	350	350	350	350	1,400
Excluded:					
Financial and Utilities firms	146	120	115	123	504
Missing data from *Datasteam*, *FAME* and *Thomson One Banker*	31	39	46	52	168
Audited by non-Big 4 auditors	1	2	1	1	5
Unavailable annual report	5	8	7	29	49
Final samples	167	181	181	145	674

Two empirical investigations have been conducted, each of which use different samples. The first investigation examines the relationship between the board of directors, the audit committee and audit quality. The total sample analysed through the three proxies of audit quality is 674 firm-year observations.

The second empirical investigation examines the relationship between the board of directors, the audit committee and auditor quality in constraining earnings management. In line with the arguments set forth by DeFond and Jiambalvo (1994) and Subramanyam (1996), the sample for the second investigation is reduced from 674 to 613 to ensure that each industry portfolio consists of at least six observations, in order to provide an unbiased estimation of discretionary accruals. Table 4.2 and Table 4.3, Panel A and B, report the distribution of the sample firms by year and industry, for the first and second empirical models respectively.

Table 4.2: Sample size and industry description for the first empirical analysis – relationships between board of directors, audit committee and audit quality

Panel A: Distribution of sample firms by year

Year	2005		2006		2007		2008		Pooled	
Sample size	*N*	Percent	*N*	Percent	*N*	Percent	*N*	Percent	*N*	Percent
	167	24.78	181	26.85	181	26.85	145	21.52	674	100.00

Panel B: Distribution of sample firms by industry

ICB Code	Supersector level	*N*	Percent
0500	Oil & Gas	36	5.34
1300	Chemicals	16	2.38
1700	Basic Resources	30	4.45
2300	Construction & Materials	20	2.97
2700	Industrial Goods & Services	229	33.98
3500	Food & Beverage	23	3.41
3700	Personal & Household Goods	49	7.27
4500	Health Care	18	2.67
5300	Retail	74	10.98
5500	Media	47	6.97
5700	Travel & Leisure	77	11.42
6500	Telecommunication	17	2.52
9500	Technology	38	5.64
Total		674	100.00

The sample observations consist of FTSE350 non-regulated firms audited by Big 4 auditors.

Table 4.3: Sample size and industry description for the second empirical analysis – relationship between board of directors, audit committee, external auditor and earnings management

Panel A: Distribution of sample firms by year

Year	2005		2006		2007		2008		Pooled	
Sample size	*N*	Percent	*N*	Percent	*N*	Percent	*N*	Percent	*N*	Percent
	149	24.31	167	27.24	170	27.73	127	20.72	613	100.00

Panel B: Distribution of sample firms by industry

ICB Code	Supersector level	*N*	Percent
0500	Oil & Gas	36	5.87
1300	Chemicals	-	-
1700	Basic Resources	26	4.24
2300	Construction & Materials	18	2.94
2700	Industrial Goods & Services	229	37.36
3500	Food & Beverage	19	3.10
3700	Personal & Household Goods	49	7.99
4500	Health Care	-	-
5300	Retail	74	12.07
5500	Media	47	7.67
5700	Travel & Leisure	77	12.56
6500	Telecommunication	-	-
9500	Technology	38	6.20
Total		613	100.00

From the total sample of 674 firm-year observations, the sample has been reduced to 613 firm-year observations to ensure that each industry portfolio consists of at least six observations in every year.

4.3 Sources of data

There are four main sources of data relevant to the study, namely *Datastream*, *FAME*, *Thomson One Banker* and the firms' annual reports. Most of the variables identified in this study were taken from *Datastream*, *FAME* and *Thomson One Banker*. The other variables, for which data was not available from these sources, were collected from the individual firms' annual reports; this refers in particular to the variables relating to the board of directors and the audit committees.

4.4 The definition and measurement of the hypothesis variables

The variables of interest examined in this study are explained in this section. There are three main variables to be examined: (1) the characteristics of the board of directors and the audit committee; (2) the audit quality proxies; and (3) earnings management.

4.4.1 The board of director and audit committee variables

The board of director and audit committee variables are related to their effective monitoring characteristics (e.g. size, composition, meeting and expertise). In both empirical investigations, the board and audit committee variables are independent variables. These variables are manually collected from the firms' annual reports, and each variable is presented in the following subsections.

4.4.1.1 <u>Board of directors size *(BRDSIZE)*</u>

Following Abbott et al. (2004) and Peasnell et al. (2000; 2005), the board of directors' size is determined by the total number of members on the board of directors, as presented in the annual report at the end of each fiscal year.

4.4.1.2 <u>Board of directors composition *(BRDNED)*</u>

The board of directors' composition is defined as the proportion of independent non-executive directors to total board size. Non-executive directors can be either independent non-executive directors or gray or affiliated non-executive directors. However, the independent non-executive directors are believed to have a better monitoring position compared to the gray or affiliated non-executive directors, since they have no relationship that would impair their judgments or decision-making (Lawrence and Stapledon, 1999; Vance, 1983). This is consistent with agency theory (Jensen and Meckling, 1976).

The definition of 'independent' is based on the UK Corporate Governance Code (2010: 8), paragraph A.3.1: "The non-executive director is not considered to be independent if the director:

(1) has been an employee of the company or group within the last five years;

(2) has, or has had within the last three years, a material business relationship with the company either directly, or as a partner, shareholder, director or senior employee of a body that has such a relationship with the company;
(3) has received or receives additional remuneration from the company apart from a director's fee, participates in the company's share option or a performance-related pay scheme, or is a member of the company's pension scheme;
(4) has close family ties with any of the company's advisers, directors or senior employees;
(5) holds cross-directorships or has significant links with other directors through involvement in other companies or bodies;
(6) represents a significant shareholder; or
(7) has served on the board for more than nine years from the date of their first election."

The independent non-executive directors exclude the chairman of the board.

4.4.1.3 Board of directors expertise *(BRDEXP)*

The board of directors' expertise is measured by the number of directors with accounting and financial qualification and experience, in proportion to the total board size. Accounting and financial expertise provide the board members with an understanding of financial statements, which enables them to assess the effectiveness of the accounting policies provided by the management. Accounting and financial qualifications and experience include all relevant forms of formal education (e.g. Bachelor in Accounting) and professional qualification (e.g. ACCA, CIMA and CFA), as well as work experience (as finance director, chief financial officer, auditor or financial controller, for example). This definition of the variable is relatively similar to Xie et al. (2003).

4.4.1.4 Board of directors meeting *(BRDMEET)*

Following Vafeas (1999), the board of directors' meetings are measured by the total number of board of directors' meetings during the year. The meetings frequency captured the boards' activity levels. Regular board meetings allow the board members to identify and resolve potential problems that may arise in their firm, particularly related to its financial health. The meetings are also an opportunity to generate and analyse strategic planning.

4.4.1.5 Audit committee size *(ACSIZE)*

The audit committee size is measured based on the total number of audit committee members presented at the end of fiscal year; this definition is consistent with Yang and Krishnan (2005).

4.4.1.6 Audit committee composition *(ACIND)*

The audit committee composition is measured by a dummy variable, coded as 1 if the audit committee consists solely of independent directors and coded as 0 if otherwise, consistent with the recommendations outlined in the UK Corporate Governance Code (2010). The rationale for having solely independent non-executive directors in the audit committee is to ensure greater impartiality and objectivity in decision-making. The definition of independence is relatively similar as defined in section 4.4.1.4.

4.4.1.7 Audit committee expertise *(ACEXP)*

As with the board of directors' expertise, audit committee expertise is measured by the number of directors with accounting and financial qualification and experience, in proportion to the total number of audit committee members. Accounting and financial expertise is essential to the audit committee members, since their main function is to ensure integrity in financial reporting. The accounting and financial knowledge may increase their understanding of financial reporting issues and of GAAP practices as well as better enabling them to assess the effectiveness of the firms' accounting policies. Accounting and financial qualifications and experience include all forms of formal education, professional qualification and work experience related to accounting and finance.

4.4.1.8 Audit committee meeting *(ACMEET)*

Following Krishnan and Visvanathan, (2009), the audit committee meeting is measured by the number of meeting during the fiscal year. The higher the number of the meetings, the higher the level of activities, which mean the more active they are.

4.4.2 Audit quality variables

Three proxies of audit quality are examined in this thesis. In the first empirical analysis, the audit quality proxies are dependent variables, whilst in the second, they are represented as independent variables. The definition and measurement of each audit quality proxy are described below.

4.4.2.1 Audit fees *(LNAFEE)*

The present study uses audit fees as a first measure of audit quality. The audit fees variable *(AFEE)* is transformed to natural log and prefixed by *LN* to achieve normality of data, in order to prevent the largest firms from unduly influencing the findings. Data for this variable *(LNAFEE)* is gathered from the *FAME* database.

4.4.2.2 Auditor independence *(FEE)*

Four measures of auditor independence are employed; (1) *LNNAF*- the magnitude of NAS fees; (2) *LNTOTALFEES* - the sum of audit and NAS fees; (3) *FEERATIO1*- the fee ratio of NAS fees to total fees; and (4) *FEERATIO2* - the fee ratio of non audit fees to audit fees. The *LNNAF* and *LNTOTALFEES* are transformed to the natural log to achieved normality of data distribution. The firms that reported zero NAS fees are set to one pound to allow for log transmission. The auditor fees data were taken from the *FAME* database.

LNNAF and *LNTOTALFEES* are associates to the fee dependence of auditor on a client. Besides the audit fees received by the auditor, the level of NAS fees further increase the client-auditor economic bond as the auditor reliance on the client increases (Simunic, 1984; Beck et al., 1988). Similar to Ashbaugh et al. (2003), the present study argues that the level of NAS fees and the sum of audit and NAS fees are better measures to capture the economic important of the client to the auditor than the NAS ratio. Although *FEERATIO1* and *FEERATIO2* do not necessarily capture the client's importance, they do explain the financial link between the auditor and the client, and have an impact on the regulators' perception of independence (Ashbaugh et al., 2003).

4.4.2.3 Industry specialist auditor *(SPEC_AUD)*

The existing literature suggests that the industry specialisation of auditors can be measured using several approaches, such as the market share approach (Krishnan, 2003a; Dunn et al., 2000; Balsam et al., 2003; Velury et al., 2003; Chen et al., 2005) and the portfolio approach (Krishnan, 2003a), as well as a complementary approach set out by Neal and Riley (2004). Despite the limitations of each approach, they are recognised as the most appropriate measures for auditor industry specialisation.

The market share approach interprets the industry specialist auditor as an auditor that can make a distinction among their opponents within a particular industry in terms of market shares (Neal and Riley, 2004). Market shares can be estimated for a specific industry using client sales, the audit fees, the total fees and the number of audit clients that are assigned to the particular auditor. The auditor(s) with the largest market share(s) in a particular industry (within-industry) are assumed to have the largest industry specific knowledge and a significant investment contribution towards the improvement of audit quality and economic of scales as compared to others competitors. Neal and Riley (2004: 170) claim that there are two disadvantages of using the market shares approach in defining industry specialist auditors: (1) more highly competitive auditors do not necessarily allocate significant resources to the development of audit technology and expertise; and (2) it is not appropriate for auditors to designate specialist in industries that are too small in generating significant revenues for them.

An alternative to the market share approach, the portfolio approach assumed each auditor individually and takes into consideration the distribution of the client's sales, the audit fees, the total fees or the number of audit clients across the various industries. The auditors with the largest portfolio share are considered as industry specialist auditors in a particular industry if they generate the most revenues from their total income or clients' sales. This may reflect their investments in audit technologies and their industry-specific knowledge, even though they are not the market share leaders in that particular industry (Neal and Riley, 2004). However, even though the portfolio approach suggests that industry specialist auditors are driven by the size of industry, the specific efforts or investment made by the auditors may not necessarily reflect their expertise in that particular industry. This inconsistency may cause larger auditors to be identified as specialists in most industries and none to be identified as specialists in the smallest industries (Neal and Riley, 2004).

Neal and Riley (2004) introduce the *weighted market share*, a complementary approach which captures the complementary effects between the market share approach and the portfolio approach. This measure offers a solution for the inconsistency between the two main approaches. However, Neal and Riley note that, like the other two approaches, this approach does not consider the lead/lag period effect. Thus, to ensure the consistency and robustness of the findings, the present study considers all three of these approaches in determining the industry specialist auditors based on audit fees.

In both empirical analyses, the industry specialist auditor is defined in five ways. The first three measures are known as a continuous variable which is equal to the respective auditors' market share *(SPECLST_MS)*, the auditors' portfolio share *(SPECLST_PS)* and compliment between the auditors' market share and portfolio share *(SPECLST_WEIGHTED).* The last two measures are identified as dichotomous variables that depend on the auditors' industry market shares; first is the industry leader, *SPECLST_MSLEADER*, coded as 1 if the auditor has earned the largest market share in each particular industry and 0 if otherwise, and lastly *SPECLST_30MS*, coded as 1 if the auditor market share exceeds 30 percent in each particular industry and 0 if otherwise. Each of these measures is computed as follows:

(1) <u>*SPECLST_MS*</u>

This is a continuous variable. *SPECLST_MS* is defined as the proportion of audit fees received by the individual auditor relative to the total audit fees received by all auditors in that particular industry (Velury et al., 2003).

$$SPECLST\_MS_{ik} = \frac{\sum_{j=1}^{J_{ikt}} AFEE_{ijkt}}{\sum_{i=1}^{I_k}\sum_{j=1}^{J_{ikt}} AFEE_{ijkt}} \qquad (1)$$

where

i = an index of the auditors (i=1, 2, 3, 4);

j = an index of clients;

k = an index of the industries

I_k = the number of auditors in industry k for year t;

J_{ikt} = the number of clients audited by auditor i in industry k for year t;

$AFEE_{ijkt}$ = the audit fees for auditor i's client j for year t.

The variable *AFEE* denotes the client's audit fees and is sourced from the *FAME* database. The numerator is the sum of the audit fees of all J_{ik} clients of auditor i in industry k, where the industry is defined at the sector level of the Industry Classification Benchmark (ICB) available in *Datastream*. The denominator in equation (1) is the audit fees of all J_{ikt} clients in industry k and year t reported in the *FAME* database, summed over all I_k auditors (all Big 4 auditors) providing audits to that particular industry and year.

(2) <u>*SPECLST_PS*</u>

This is a continuous variable. *SPECLST_PS* is identified as the proportion of the total audit fees in each industry divided by the total audit fees of all industry received by the particular auditor. The computation of the auditor portfolio share is shown below:

$$SPECLST\_PS_{ik} = \frac{\sum_{j=1}^{J_{ikt}} AFEE_{ijkt}}{\sum_{k=1}^{K}\sum_{j=1}^{J_{ikt}} AFEE_{ijkt}} \qquad (2)$$

where

i = an index of the auditors (i=1, 2, 3, 4);

j = an index of clients;

k = an index of the industries

J_{ikt} = the number of clients audited by auditor i in industry k for year t;

$AFEE_{ijkt}$ = the audit fees for auditor i's client j for year t.

AFEE represents the client's audit fees and is sourced from the *FAME* database. As with the market share approach, the numerator is the sum of the audit fees of all J_{ik} clients of auditor *i* in industry *k,* where the industry is defined at the sector level of the ICB. The denominator is the sum of the audit fees received by auditor *i* across all *k* industries in year *t*.

(3) *SPECLST_WEIGHTED*

The last measure is a complementary measure which incorporates both the market share and the portfolio approaches. This is a continuous variable and was introduced by Neal and Riley (2004). *SPECLST_WEIGHTED* is computed as variable *SPECLST_MS* multiplied by *SPECLST_PS.*

(4) *SPECLST_MSLEADER*

This is a dichotomous variable. *SPECLST_MSLEADER* is coded as 1 if the incumbent auditor earned the largest market share in the particular industry, 0 if otherwise. This measure identifies the auditor as the industry market leader. The computation is the same as *Equation (1).*

(5) *SPECLST_30MS*

This measure is a dichotomous variable. *SPECLST_30MS* is coded as 1 if the auditor market share exceeds 30 percent in each particular industry, 0 if otherwise. The market share cut-off for specialisation is identified as at 30 percent without specialisation, with each firm holds a market share of approximately 0.25 percent (1 firm/4 firms = 0.25). The 0.25 percent is multiplying by 1.20 yields 30 percent (Neal and Riley, 2004). The computation of the auditor industry market share is as in *Equation (1).*

Based on the computations of the market share and portfolio share approaches, Tables 4.4 and 4.5 report the summary of Big 4 auditor industry specialists by year and pooled samples respectively. Across the years and pooled tables, according to the *SPECLST_30MS* definition, it can be considered that PWC is the specialist in most industries, while EY is considered to be a specialist only in the travel and leisure industry, except in 2008, when it also was known as a specialist in the media and technology industries. DL and KPMG are relatively comparable in terms of the number of specialisations. For example, in the period 2005 to 2008 (pooled), DL is a specialist in four industries: basic resources, construction & materials, media and telecommunications, and KPMG is also a specialist in four industries, namely chemicals, construction & materials, industrial goods & services and food & beverages.

Table 4.4: The Big 4 auditor industry specialists (by year)								
Panel A: Industry Market Share (in %)								
ICB Code	2005				2006			
	DL	EY	KPMG	PWC	DL	EY	KPMG	PWC
0500	23.856	8.106	-	**68.038**	10.269	14.463	-	**75.268**
1300	9.926	-	**82.410**	7.664	-	-	**87.237**	12.763
1700	**38.721**	22.562	24.638	14.079	**31.720**	21.865	24.993	21.422
2300	**38.423**	-	29.287	**32.29**	**41.855**	-	**58.145**	-
2700	17.694	11.773	**42.551**	27.982	15.012	9.617	**39.208**	**36.163**
3500	4.545	4.545	**60.606**	**30.304**	3.333	5.000	**33.333**	**58.334**
3700	2.059	-	7.923	**90.018**	2.611	-	10.552	**86.837**
4500	11.429	14.286	7.143	**67.142**	2.684	12.567	28.199	**56.550**
5300	19.929	5.284	14.590	**60.197**	18.251	5.979	12.901	**62.869**
5500	**49.239**	7.711	6.425	**36.625**	**69.483**	4.594	3.281	22.642
5700	27.722	**35.642**	5.657	**30.979**	20.556	**49.549**	5.798	24.097
6500	**34.458**	-	-	**65.542**	**55.523**	-	4.331	**40.146**
9500	8.299	22.189	3.239	**66.273**	28.619	3.773	4.463	**63.145**
ICB Code	2007				2008			
	DL	EY	KPMG	PWC	DL	EY	KPMG	PWC
0500	29.228	8.115	-	**62.657**	15.822	15.583	23.859	**44.736**
1300	-	-	**66.741**	**33.259**	25.974	-	**74.026**	-
1700	18.761	23.195	16.314	**41.730**	48.985	-	**48.985**	2.030
2300	**62.006**	-	**37.994**	-	**80.000**	-	20.000	-
2700	20.172	11.015	**35.617**	**33.196**	21.358	4.131	**42.441**	**32.070**
3500	2.044	5.399	**38.565**	**53.992**	23.097	1.768	**44.197**	**30.938**
3700	7.286	-	7.764	**84.950**	3.435	-	6.304	**90.261**
4500	3.029	11.408	28.521	**57.042**	-	14.218	**33.649**	**52.133**
5300	18.301	5.396	10.402	**65.901**	24.924	2.935	7.340	**64.801**
5500	**63.155**	7.774	6.303	22.768	**61.721**	**31.190**	7.089	-
5700	22.326	**48.421**	6.316	22.937	**30.679**	**39.424**	7.755	22.142
6500	**61.814**	-	7.636	**30.550**	**35.638**	-	18.837	**45.525**
9500	25.941	7.377	-	**66.682**	26.904	**30.002**	1.454	**41.640**

Table 4.4 (continued)								
Panel B: Industry Portfolio Share (in %)								
ICB Code	2005				2006			
	DL	EY	KPMG	PWC	DL	EY	KPMG	PWC
0500	2.352	1.470	-	3.808	0.775	2.474	-	3.641
1300	1.072	-	8.458	0.470	-	-	6.871	0.588
1700	22.776	24.413	13.765	4.701	13.587	21.216	11.726	5.877
2300	4.928	-	3.567	2.351	3.651	-	5.555	-
2700	23.507	28.777	53.693	21.102	17.427	25.291	49.854	26.886
3500	0.621	1.143	7.866	2.351	0.612	2.079	6.701	6.856
3700	0.725	-	2.649	17.987	0.612	-	2.707	13.026
4500	3.313	7.617	1.966	11.047	0.653	6.929	7.518	8.815
5300	5.311	2.590	3.693	9.106	4.529	3.361	3.506	9.991
5500	15.865	4.570	1.967	6.699	32.386	4.850	1.675	6.759
5700	10.144	23.994	1.967	6.436	5.965	32.570	1.843	4.478
6500	8.282	-	-	8.941	15.685	-	1.340	7.263
9500	1.104	5.426	0.409	5.001	4.118	1.230	0.704	5.820
ICB Code	2007				2008			
	DL	EY	KPMG	PWC	DL	EY	KPMG	PWC
0500	2.913	1.745	-	3.824	1.700	4.718	2.318	3.185
1300	-	-	2.165	0.521	0.960	-	2.478	-
1700	9.790	26.125	10.788	13.336	11.213	-	10.148	0.308
2300	7.236	-	5.619	-	6.408	-	1.450	-
2700	22.088	26.030	49.425	22.259	25.675	13.997	46.171	25.552
3500	0.376	2.144	8.991	6.083	8.372	1.806	14.497	7.432
3700	1.986	-	2.683	14.184	1.282	-	2.128	22.318
4500	0.753	6.125	8.991	8.689	-	13.545	10.293	11.679
5300	4.668	2.970	3.363	10.294	6.408	2.127	1.708	11.042
5500	16.137	4.287	2.041	3.563	13.948	19.866	1.450	-
5700	6.019	28.173	2.158	3.787	7.604	27.542	1.740	3.638
6500	24.121	-	3.776	7.301	11.213	-	5.364	9.494
9500	3.912	2.401	-	6.159	5.217	16.399	0.255	5.352

Table 4.4 (continued)

ICB Code (supersector levels): 0500-Oil & Gas; 1300- Chemicals; 1700- Basic Resources; 2300- Construction & Materials; 2700- Industrial Goods & Services; 3500- Food & Beverage; 3700- Personal & Household Goods; 4500- Health Care; 5300- Retail; 5500- Media; 5700- Travel & Leisure; 6500- Telecommunications; 9500- Technology; DL: Deloitte; EY: Ernst & Young; KPMG: KPMG Peat Marwick; PWC: Price Waterhouse Coopers. The audit fees is used as the based in calculating the auditor industry expertise. The following examples illustrate how the auditor industry expertise are been computed. For the period 2005, the total audit fees received by DL in the Oil & Gas industry amounted £1.136 millions and the total audit fees of DL for all industries amounted £48.3 millions. During the same period, the combined audit fees of all auditors (DL, EY, KPMG and PWC) in the Oil & Gas industry amounted £4.762 millions. The DL market share $_{\text{Oil \& Industry, 2005}}$=£1.136/£4.762*100=23.856%. The DL portfolio share $_{\text{Oil \& Industry, 2005}}$=£1.136/£48.3*100=2.352. The industry expertise for other auditors and the subsequence years are also been computed in a similar ways. The auditor expertise in **bold** is where market shares exceed 30%. A dash (-) means that the auditor did not have client in that particular industry.

Table 4.5: The Big 4 auditor industry specialist (by pooled)								
ICB Code	Auditor Industry Expertise for 2005-2008 (in %)							
	DL		EY		KPMG		PWC	
	MS	PS	MS	PS	MS	PS	MS	PS
0500	20.304	1.929	11.588	2.470	6.829	0.680	**61.279**	3.621
1300	7.966	0.453	0.000	0.000	**80.633**	4.812	11.401	0.404
1700	**31.431**	13.701	19.598	19.163	25.119	11.483	23.852	6.467
2300	**55.199**	5.624	0.000	0.000	**36.840**	3.936	7.961	0.504
2700	18.593	22.038	9.051	24.068	**39.824**	49.502	**32.532**	23.985
3500	11.424	2.511	3.692	1.819	**42.442**	9.781	**42.442**	5.801
3700	3.943	1.197	0.000	0.000	7.916	2.519	**88.141**	16.635
4500	3.732	1.037	13.130	8.187	25.658	7.480	**57.480**	9.938
5300	20.304	5.197	4.897	2.812	11.120	2.985	**63.679**	10.139
5500	**62.593**	19.838	10.748	7.642	5.291	1.759	21.368	4.212
5700	25.012	7.214	**43.588**	28.202	6.328	1.914	25.072	4.499
6500	**49.539**	15.514	0.000	0.000	8.547	2.807	**41.914**	8.164
9500	23.959	3.747	16.066	5.637	2.085	0.342	**57.890**	5.631

ICB Code (supersector levels): 0500-Oil & Gas; 1300- Chemicals; 1700- Basic Resources; 2300- Construction & Materials; 2700- Industrial Goods & Services; 3500- Food & Beverage; 3700- Personal & Household Goods; 4500- Health Care; 5300- Retail; 5500- Media; 5700- Travel & Leisure; 6500- Telecommunications; 9500- Technology; DL: Deloitte; EY: Ernst & Young; KPMG: KPMG Peat Marwick; PWC: Price Waterhouse Coopers; MS: market share, PS: Portfolio share; The audit fees is used as the based in calculating the auditor industry expertise. The following examples illustrate how the auditor industry expertise are been computed. For the period 2005 through 2008, the total audit fees received by DL in the Oil & Gas industry amounted £4.757 millions and the total audit fees of DL for all industries amounted £246.59 milions. During the same period, the combined audit fees of all auditors (DL, EY, KPMG and PWC) in the Oil & Gas industry amounted £23.429 millions. The DL market share $_{\text{Oil \& Industry, 2005-2008}}$=£4.757/£23.429*100=20.304%. The DL portfolio share $_{\text{Oil \& Industry, 2005-2008}}$=£4.757/£246.59*100=1.929. The DL weighted market share $_{\text{Oil \& Industry, 2005-2008}}$=20.304*1.929/100=0.392. The industry expertise for other auditors are been computed in a similar ways. The auditor expertise in **bold** is consider to be a specialist according to *SPECLST_30MS'* definitions (i.e. the auditors are considered to be a specialist when they had the market shares that exceed 30 percent).

4.4.3 Earnings management variables

Earnings management is the dependent variable in the second empirical analysis and is measured by the absolute value of discretionary accruals. In accordance with Becker et al. (1998), the absolute value of discretionary accruals measures the level of opportunistic earnings management activities and extreme reporting decision exercises by the managers.

The total accruals are identified in order to estimate the discretionary accruals. There are two methods in computing the total accrual accruals; the first is the traditional balance sheet approach (e.g. Healy, 1985; Dechow et al., 1995), and the second is the cash flow approach (e.g. Becker et al., 1998; Subramaniam, 1996; Xie et al., 2003).[42] Both approaches are extensively used in the prior literature. However, Hribar and Collins (2002) suggest that the cash flow approach is better than the balance sheet approach when estimating the accruals for earnings management. They claim that the balance sheet approach contain the error measurement, which can lead to erroneously conclusion of the existing of earnings management when no such earnings management was detected. Following Hribar and Collins (2002) argument, the present study employed the cash flow approach in computing the total accruals.

The discretionary accruals are estimated using a cross-sectional variation of the Jones (1991), the modified Jones (1991) by Dechow et al. (1995) and the performance-adjusted model by Kothari et al (2005). Following DeFond and Jiambalvo (1994), the cross-sectional version is employed as it is more specific than the time version model

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[42] Under the balance sheet approach, the accruals are measured as follows (Hribar and Collins, 2002: 107):

$$TACC_t = \Delta CA_t - \Delta CL_t - \Delta Cash_t + \Delta DEBT - DEP$$

where TACC=total accruals; ΔCA_t=the change in current assets during year t; ΔCL_t=the change in current liabilities during year t; $\Delta Cash_t$=the change in cash and cash equivalent during period t; $\Delta DEBT$=the change in debt included in current liabilities during period t and DEP=depreciation and amortization expenses during period t. All variables are scaled by lagged total assets.

The cash flow approach, on the other hand, measures the accruals as the difference between earnings before extraordinary items and earnings before discontinued operation, less the operating cash flow (Hribar and Collin, 202: 109).

due to the small sample observations (Subramanyam, 1996). All data is sourced are from *Datastream*.

4.4.3.1 Discretionary accruals under the Jones model *(DACCJM)*

Two steps are involved in the estimation of discretionary accruals. First is the estimation of non-discretionary accruals, using the following model. This begins with the estimation of coefficients $\acute{\alpha}_1$, $\acute{\alpha}_2$, and $\acute{\alpha}_3$ for each industry in each year (at least 6 firms in each industry) by using OLS regression. The second step is to estimate the error term in the model, which represents the discretionary component of accrual. This error term is the difference between the total accruals and the non-discretionary accruals.

$$\frac{TACC_{ijt}}{TA_{ijt-1}} = \acute{\alpha}_1 \frac{1}{TA_{ijt-1}} + \acute{\alpha}_2 \frac{\Delta REV_{ijt}}{TA_{ijt-1}} + \acute{\alpha}_3 \frac{PPE_{ijt}}{TA_{ijt-1}} + e_{ijt} \qquad (3)$$

where:

$DACC_{ij}$	=	discretionary accruals for sample firm i in industry j for year t;
$TACC_{ijt}$	=	total accruals for sample firm i in industry j for year t;
TA_{ijt-1}	=	total assets for sample firm i in industry j for year t-1;
ΔREC_{ijt}	=	change in account receivable for sample firm i in industry j for year t;
PPE_{ijt}	=	gross property plant and equipment for sample firm i in industry j for year t;
e_{ijt}	=	error term for sample firm i in industry j for year t;

The total accruals are computed as earnings before extraordinary items and earnings before discontinued operations, less the net cash flows from operating activities. The industry (*j*) is classified using the Industry Classification Benchmark (ICB) by Dow Jones and FTSE.

4.4.3.2 Discretionary accruals under the modified Jones model *(DACCMJM)*

The estimation of discretionary accruals under the modified Jones (1991) model is relatively similar to the original Jones model, except that it takes into account the changes in account receivable. The non-discretionary accruals are estimated using the model below; the steps involved are relatively similar to the original Jones (1991) model.

$$\frac{TACC_{ijt}}{TA_{ijt-1}} = \acute{\alpha}_1 \frac{1}{TA_{ijt-1}} + \acute{\alpha}_2 \frac{\Delta REV_{ijt} - \Delta REC_{ijt}}{TA_{ijt-1}} + \acute{\alpha}_3 \frac{PPE_{ijt}}{TA_{ijt-1}} + e_{ijt} \qquad (4)$$

where:

$DACC_{ij}$	=	discretionary accruals for sample firm i in industry j for year t-1;
$TACC_{ijt}$	=	total accruals for sample firm i in industry j for year t;
TA_{ijt-1}	=	total assets for sample firm i in industry j for year t-1;
ΔREV_{ijt}	=	change in revenues for sample firm i in industry j for year t;
ΔREC_{ijt}	=	change in account receivable for sample firm i in industry j for year t;
PPE_{ijt}	=	gross property plant and equipment for sample firm i in industry j for year t;
e_{ijt}	=	error term for sample firm i in industry j for year t;

4.4.3.3 Performance-Adjusted Discretionary Accruals *(DACCROA)*

Kothari et al. (2005) suggest that there are two ways to control the firms' performance in the estimated accruals. The first is by matching each firm-year observation with another from a similar industry and year with the closest *ROA* in the current. Alternatively, firm performance, including *ROA*, can be included in the discretionary accruals regression as an additional variable. Due to the small sample size, the second method is employed in this thesis.

Similar steps are involved. Firstly, it begins with the estimation of coefficients $\acute{\alpha}_1$, $\acute{\alpha}_2$, $\acute{\alpha}_3$ and $\acute{\alpha}_4$ for each industry in each year by using OLS regression to extract the non-discretionary accruals. Then, the error terms are estimated according to the difference between the total accruals and the non-discretionary accruals, which represents the discretionary component of the accruals. The model is as follows:

$$\frac{TACC_{ijt}}{TA_{ijt-1}} = \acute{\alpha}_1 \frac{1}{TA_{ijt-1}} + \acute{\alpha}_2 \frac{\Delta REV_{ijt} - \Delta REC_{ijt}}{TA_{ijt-1}} + \acute{\alpha}_3 \frac{PPE_{ijt}}{TA_{ijt-1}} + \acute{\alpha}_4\ ROA_{ijt-1} + e_{ijt} \quad (5)$$

where:

$DACC_{ij}$ = discretionary accruals for sample firm i in industry j for year t-1;

$TACC_{ijt}$ = total accruals for sample firm i in industry j for year t;

TA_{ijt-1} = total assets for sample firm i in industry j for year t-1;

ROA_{ijt-1} = return on asset for sample firm i in industry j for year t-1;

ΔREV_{ijt} = change in revenues for sample firm i in industry j for year t;

ΔREC_{ijt} = change in account receivable for sample firm i in industry j for year t;

PPE_{ijt} = gross property plant and equipment for sample firm i in industry j for year t;

e_{ijt} = error term for sample firm i in industry j for year t;

4.5 Model specifications and related control variables

Three models of audit quality are used to test the relationship between the effectiveness of the board of directors and the audit committee characteristics on audit quality. These models are: the audit fees model, the NAS fees model and the auditor industry specialist model. In order to examine the relationship between the board of directors, the audit committee and auditor quality in constraining opportunistic earnings, the earnings management model is employed..

A number of control variables are included in the models due to their real effect on the estimation of audit quality and earnings management, all identified in the prior literature. Since the prior studies differ in their use of control variables, in this thesis the selection of the control variables are cited from key papers in the area of investigation. If these variables were not controlled, it would likely lead to bias in estimating audit quality and earnings management. Each of these models and related control variables are described below.

4.5.1 Audit fees model

Simunic (1980) suggests that audit fees are a function of two basic components: (1) the quantity of resources and (2) the expected future loss components. The first component refers to the cost in audit resources associated with auditor effort or audit hours and the second component refers to the projected likelihood of future losses that the auditor may suffer, such as sanctions by regulatory agencies and litigation. These two components can be categorised into three set of variables, namely size, complexity and risk sharing (Simunic, 1980). DeFond et al. (2000) suggest that an audit fees model that contains these variables has a higher explanatory power and is more robust across samples, countries and time periods. Motivated by this reason, below is the estimated models used to examine the relationship between the board and audit committee characteristics, and audit fees:

$$
\begin{aligned}
LNAFEE = {} & \alpha_0 + \beta_1 BRDSIZE + \beta_2 BRDNED + \beta_3 BRDEXP + \\
& \beta_4 BRDMEET + \beta_5 ACSIZE + \beta_6 ACIND + \beta_7 ACEXP + \\
& \beta_8 ACMEET + \beta_9 SQSUBS + \beta_{10} FORGN + \beta_{11} RECINV \\
& + \beta_{12} LEVERG + \beta_{13} LNASSET + \varepsilon \qquad (6)
\end{aligned}
$$

Where

Dependent variable:

LNAFEE	=	the natural log of audit fees;

Hypothesis variables:

BRDSIZE	=	the numbers of board' members during the year;
BDRNED	=	the proportion of non-executive directors on board to board size;
BRDEXP	=	the proportion of directors with accounting experience and financial qualification to board size;
BRDMEET	=	the number of board meetings during the year;
ACSIZE	=	the number of audit committee members;
ACIND	=	coded as 1 if audit committee had solely non-executive directors; 0 otherwise;
ACEXP	=	the proportion of audit committee members with accounting experience and financial qualification to audit committee size;

ACMEET	=	the number of audit committee meetings during the year;

Control variables:

SQSUBS	=	the square root of total consolidated subsidiaries;
FORGN	=	the proportion of foreign subsidiaries to total consolidated subsidiaries;
RECINV	=	the proportion of total assets in account receivable and inventory;
LEVERG	=	the proportion of debts to total assets;
LNASSET	=	the natural logarithm of total assets;

The choice of control variables captured the size, complexity and risk sharing factors (Simunic, 1980). These variables are relatively similar to those adopted in Abbott and Parker's (2003) study, which also examines audit fees and the characteristics of the board and audit committee. However, the current study excludes the variable of audit opinion, since all of the firms in the sample received an unqualified audit opinion. Despite the fact that the variable of audit opinion is a proxy for risk sharing, the present study replaces it with the *LEVERG*, consistent with Menon and Williams (2001). The current study believes that *LEVERG* and *RECINV* variables are sufficient to represent the risk sharing factor. All of the control variables are sourced from *Datastream* except for the *SQSUBS* and *FORGN*, which are hand collected from the annual reports.

The variables *SQSUBS* and *FORGN* are proxies for the complexity of firm operation. *SQSUBS* is measured as the square root of the total consolidated subsidiaries and *FORGN* is measured as the ratio of foreign subsidiaries to total subsidiaries. The prior literature suggests that as the firms' business complexities increase, the auditors may need to put more audit effort and audit hours into dealing with the complex business operations, in turn resulting in higher audit fees (Simunic, 1980; Craswell and Francis, 1999; Abbott et al., 2003a; Carcello et al., 2002). These studies argue that the level of audit effort increases with the geographical coverage and the number of transactions in the subsidiaries. The present study expects these variables to be positively associated with audit fees.

The variables *RECINV* and *LEVERG* are proxies for risk-sharing factors, where *RECINV* is measured as the proportion of total assets in the account receivable and inventory. According to Simunic (1980: 173), the account receivable and inventory are the two "risky" items in the balance sheet that need more specific auditing procedures. These items require the auditor to make confirmation, observation and the valuation because it anticipates the forecast on the future events and may expose to a higher material misstatement (Simunic, 1980). In addition to this, Pratt and Stice (1994) claim that a higher *RECINV* is associated with a higher probability of audit failure. Such considerable effort and the raised possibility of misstatement increase the likelihood of audit failure, thus requiring more audit hours, resulting in increased audit fees. In line with these arguments and the prior studies that control this variable in their audit fees models (Simunic, 1980; Pratt and Stice, 1994; Palmrose, 1986a; Francis and Stokes, 1986; Francis and Simon, 1987; Abbott et al., 2003a; Carcello et al., 2002), the present study predicts a positive relationship between the variable *RECINV* and audit fees.

LEVERGN is defined as the proportion of debts to total assets and measures the clients' financial condition. According to Pratt and Stice (1991), clients in poor financial condition can cause more frequent audit failure because the firms experiencing the weak financial condition probably carry a higher risk of material misstatement, which may be difficult for the auditors to detect. Prior literature treats the leverage as the auditor' perceived litigation risk (Simunic and Stein, 1996; Menon and Williams, 2001, Pratt and Stice, 1994). The higher the litigation risk, the higher the auditors perceived they may involve in litigation. It is been argued that the auditors increase the audit fees and audit effort in the firms that experience higher leverage, in order to trade off the auditor' litigation risk. Consequently, the *LEVERGN* is expected to be positively associated with the audit fees.

LNASSETS is a measure of firm size and is defined as the natural log of the total assets (Simunic, 1980; Abbott et al., 2003a; Carcello et al., 2002). As the firm' size increased, the auditors extend the audit scope and audit test accordingly. Such extensive efforts increase audit hours and fees, and thus the present study predicts a positive relationship between total assets and audit fees.

4.5.2 NAS fees model

Firth (1997) and Parkash and Venable (1993) suggest that NAS fees are the function of agency cost, audit complexity, audit risk and demand for consulting services. In line with these, the present study estimates the following model:

$$\begin{aligned} FEE = {} & \beta_0 + \beta_1 BRDSIZE + \beta_2 BRDNED + \beta_3 BRDEXP + \\ & \beta_4 BRDMEET + \beta_5 ACSIZE + \beta_6 ACIND + \beta_7 ACEXP + \\ & \beta_8 ACMEET + \beta_9 INOWN + \beta_{10} BLOCK + \beta_{11} LEVERG + \\ & \beta_{12} RETURN + \beta_{13} LNASSET + \beta_{14} ACQ + \beta_{15} NWFUND + \\ & \beta_{16} NEWDIR + \beta_{17} RESTR + \varepsilon \end{aligned} \tag{7}$$

Where

Dependent variable:

FEE	=	*LNNAF*, *LNTOTALFEES*, *FEERATIO1* and *FEERATIO2*.

Hypothesis variables:

BRDSIZE	=	the numbers of board' members during the year;
BRDNED	=	the proportion of non-executive directors on board to board size;
BRDEXP	=	the proportion of directors with accounting experience and financial qualification to board size;
BRDMEET	=	the number of board meetings during the year;
ACSIZE	=	the number of audit committee members;
ACIND	=	coded as 1 if audit committee had solely non-executive directors; 0 otherwise;
ACEXP	=	the proportion of audit committee members with accounting experience and financial qualification to audit committee size;
ACMEET	=	the number of audit committee meetings during the year;

Control variables:

INOWN	=	the cumulative percentage of total shares owned by the directors of a firm;
BLOCK	=	the cumulative percentage shares ownership of the blockholders who hold at least 5 percent or more of outstanding common shares and who are unaffiiliated with

management;

LEVERG	=	the proportion of debts to total assets;
RETURN	=	the fiscal year total stock return;
LNASSET	=	the natural logarithm of total assets;
ACQ	=	the number of acquisitions made by the company during the year;
NWFUND	=	coded as 1 if the firm issued new shares or debt for cash during the year, 0 otherwise;
NEWDIR	=	coded as 1 if the firm appoint new external director during the year, 0 otherwise;
RESTR	=	coded as 1 if the restructuring program has occurred during the year, 0 otherwise;

The choice of control variables is in line with the study conducted by Abbott et al. (2003b), which examines the relationship between NAS and the characteristics of the board and audit committee.[43]These variables have been found by the prior literature to be significant in explaining the magnitude of NAS purchased, which include *INOWN*, *BLOCK*, *LEVERG, RETURN*, *LNASSET, ACQ, ISSUE*, *NEWDIR* and *RESTR* (Firth, 1997; Parkash and Venable, 1993). All of the control variables are obtained from *Datastream* except for the variables *ACQ* and *NEWISSUE*, which are sourced respectively from *Thomson One Banker* database and annual report.

The variables *INOWN*, *BLOCK* and *LEVERG* control for agency costs. *INOWN* is measured by the cumulative percentage of total shares owned by the directors of a firm at the beginning of the fiscal year. Jensen and Meckling (1976) suggest that the higher the level of insider ownership, the lower the agency costs, since the directors of externally owned firms will presumably realign their interests with the external owners. Such alignment is likely to initiate greater monitoring because the directors perceive themselves to be more accountable regarding their actions, and are thus likely to demand a higher quality audit. Consistent with this argument, the present study anticipates a negative relationship between *INOWN* and *FEE.*

[43] However, the present study excludes the variable of the big-size auditor because all of the firms in the sample are audited by big-size auditors.

BLOCK is defined as the cumulative percentage of ownership of the blockholders who hold at least 5 % or more of outstanding common shares and are unaffiiliated with management.[44] Parkash and Venable (1993) claim that when outside ownership is higher, the agency cost is likely to decrease because such significant ownership provides incentives for direct monitoring. Greater monitoring appears to limit the NAS purchased, as it seems that higher NAS compromises the independence of the auditor, resulting in a low-quality audit. On the other hand, Abbott et al. (2003b) claim that, as a result of information asymmetry between the management and outside blockholders, the latter probably have limited access to insider information and are therefore more likely to depend on the information provided by the management to facilitate their monitoring function. Since there are two opposite arguments regarding the *BLOCK* variable, the present study does not make any specific prediction about the relationship between *BLOCK* and *FEE.*

LEVERG is also a measure for agency cost. Agency theory suggests that managers have the incentive to transfer wealth from debtholders to shareholders using various actions (Jensen and Meckling, 1976). As the amount of debt increases, the higher the incentive of wealth will be transferred from the debtholders to shareholders and thus, initiate greater demand for a highly independent auditor (Palmrose, 1986a; Simunic and Stein, 1987; Francis and Wilson, 1988; DeFond, 1992).). In other words, the firms experiencing higher leverage are more likely to demand a higher quality auditor or a more highly independent auditor in order to verify the accounting number related to the covenant compliance. Since the prior literature suggests that the auditors' independence decreases as the amount of NAS purchased increases, the present study predicts a negative relationship between *LEVERG* and *FEE.*

RETURN is a measure of firm performance and is defined by the total stock return for the fiscal year. According to Houghton and Ikin (2001), the poor performance of firms is related to ineffective and inefficient operations, inappropriate management strategies, lack of competitiveness and the obsolescence of product and information technology. These concerns might increase the incentive for firms to hire external

[44] The blockholders are also known as 'institutional investors' or large investors, rather than individual investors, and include pension funds, mutual funds, corporations, insurance firms, private equity firms, banks and trusts (Cronqvist and Fahlenbrach, 2009).

consultants for expert advice. Indeed, Firth (1997) argues that firms with a poor stock market return are more likely to demand external advice on how to improve their performance than firms with a higher stock return. Thus, the present study predicts a positive relationship between *RETURN* and *FEE*.

LNASSET is a measure of firm size. The demand for NAS increases as the size of the firm expands (Firths, 1997; Houghton and Ikin, 2001). When the size of the firm grows, the firm becomes more complex and may thus demand greater NAS. *FEE* is therefore expected to be positively related to *LNASSET*.

Corporate acquisition *(ACQ)*, the issuance of new shares, the borrowing of cash *(ISSUE)*, the new appointment of external non-executive directors *(NEWDIR)* and firm restructurings *(RESTR)* are the variables associated with the events that create the demand for NAS (Firths, 1997). These variables represent relatively irregular events but might potentially have a major impact on the firms. The present study expects positive relationships between these variables and *FEE*.

4.5.3 Industry specialist model

Prior studies model the industry specialist auditor as a function of agency cost, audit risk and firm' business complexities (Francis and Wilson, 1988; DeFond, 1992; Firth and Smith, 1992). Following these studies, the model specification is as follows:

$$SPEC\_AUD = \beta_0 + \beta_1 BRDSIZE + \beta_2 BRDNED + \beta_3 BRDEXP + \beta_4 BRDMEET + \beta_5 ACSIZE + \beta_6 ACIND + \beta_7 ACEXP + \beta_8 ACMEET + \beta_9 INOWN + \beta_{10} LNASSET + \beta_{11} LEVERG + \beta_{12} NWFUNDRATIO + \beta_{13} ROA + \beta_{14} SQSUB + \beta_{15} FORNSALE + \varepsilon \quad (8)$$

where

Dependent variable:

SPEC_AUD	=	*SPECLST_MSLEADER*, *SPECLST_30MS*, *SPECLIST_MS*, *SPECLIST_PS* and *SPECLST_WEIGHTED*.

Hypothesis variables:

BRDSIZE	=	the numbers of board' members during the year;

BRDNED	=	the proportion of non-executive directors on board to board size;
BRDEXP	=	the proportion of directors with accounting experience and financial qualification to board size;
BRDMEET	=	the number of board meetings during the year;
ACSIZE	=	the number of audit committee members;
ACIND	=	coded as 1 if audit committee had solely non-executive directors; 0 otherwise;
ACEXP	=	the proportion of audit committee members with accounting experience and financial qualification to audit committee size;
ACMEET	=	the number of audit committee meetings during the year;

Control variables:

INOWN	=	proportion of outstanding ordinary shares owned directly by directors on the board;
LNASSET	=	natural logarithm of total assets;
LEVERG	=	proportion of debts to total assets;
NWFUNDRATIO	=	proceed from new debt and equity issuances/ total assets;
ROA	=	return on assets;
SQSUB	=	square root of total consolidated subsidiaries;
FORGNSALE	=	proportion of the firm' foreign sales.

The control variables chosen are relatively similar to those chosen by Abbott and Parker (2000) and Chen et al. (2005), and include *INOWN*, *LNASSET, LEVERG, NWFUND, ROA*, *SQSUB* and *FORGNSALE*. The theoretical justifications of these variables stem from previous related studies on big-size auditors (Francis and Wilson, 1988; DeFond, 1992; Firth and Smith, 1992).[45]

INOWN, LNASSETS and *LEVERG* are the proxies for the agency variables. *INOWN* is a measure for the insider ownership, and there are two arguments to explain the relationship between *INOWN* and *SPEC_AUD*. Firstly, as the insider ownership increases, the directors align their interests with those of the external owners, and thus

[45] As explained in Chapter 3 (see page 66), the theoretical foundation for industry specialist auditors is derived from reputation capital theory among the big-size auditors.

initiate greater monitoring of management actions (Jensen and Meckling, 1976). Since they perceive themselves as part of the firm structure, they demand a higher quality audit, engaging the industry specialist auditor. This indicates a positive relationship between *INOWN* and *SPEC_AUD* (Abbott and Parker, 2000). The second argument suggests that as the insider ownership increases, the directors obtain more detailed inside information about the firms (Firth, 1997), and hence have less need for a higher quality auditor. This argument leads to a negative relationship between *INOWN* and *SPEC_AUD.* Since there are two possible arguments, no prediction is made for this variable.

LNASSET is a proxy for firm size. Chen et al. (2005) argue that larger firms are likely to engage a higher quality auditor because the agency costs increase as the firm size grows (Francis and Wilson, 1988; Firth and Smith, 1992). The higher the agency cost, the higher the demand for industry specialist auditors. The present study therefore predicts a positive relationship between *LNASSET* and *SPEC_AUD.*

LEVERG is the ratio of total debt to total assets. As the level of leverage increases, the agency costs also increase as a result of the increased likelihood of wealth transferral from debtholders to shareholders. Such conditions create a demand for a higher quality audit to verify the accounting numbers in the debt contract by reducing the information asymmetry between the debtholders and managers. In line with Abbott and Parker (2000) and Chen et al. (2005), the present study controls *LEVERG* for the extent of agency cost in the auditor industry specialist model. The present study expects that the leverage will be positively related to the engagement of industry specialist auditors.

NWFUND is defined as the firm's acquisition of new debts and equity issuances, in proportion to the firm's total assets. Titman and Trueman (1986) claim that the appointment of a higher quality auditor signal credibility of information to the users. Thus, several studies suggest that by engaging a higher quality auditor, i.e. an industry specialist auditor, the firms may increase the marketability of new securities to outsiders, because these firms are perceived to have more credible information (DeFond, 1992; Francis and Wilson, 1988; Johnson and Lys, 1990). It is been argue that the monitoring function by the reputable auditor increased the credibility of the firm' information and thus more favour in making new securities or obtaining new borrowing. Consistent with Abbott and Parker (2000) and Chen et al. (2005), the present study predicts a positive relationship between *NWFUND* and *SPEC_AUD.*

ROA is a measure of client profitability and risk. According to Abbott and Parker (2000), more profitable firms are more likely to engage industry specialist auditors because they are more willing to pay the fee premium. On the other hand, *ROA* could also act as a risk-sharing proxy. Some studies suggest that riskier firms are more likely to appoint a higher quality auditor in order to signal the credibility of information to outsiders (Datar et al., 1991; Hogon, 1997; Copley and Douthett, 2002). These studies argue that the demand for a higher quality auditors increases with the firm risk. Since there are two possible arguments, the direction of this variable is not predicted.

Similar to the audit fees model, *SQSUB* and *FORGNSALE* are the proxies for firm complexity. The more complex the firms' operation, the greater the need for a higher quality auditor (Collier and Gregory, 1996; Simon and Francis, 1988). Following Abbott and Parker (2000) and Chen et al (2005), it is been argue that the diversification of the clients' subsidiaries and higher foreign sales are expected to increase the complexity of the firms' financial reporting system, the audit program and audit scope, and these create the greater need for the industry specialist auditor. The present study expects a positive relationship between these two variables and engagement of industry specialist auditor.

4.5.4 Earnings management model

The earnings management model follows that of Klein (2002) and Bédard et al. (2004), who examine the effects of the board and audit committee characteristics and the auditor quality on opportunistic earnings. The model specification is as follows:

$$\begin{aligned} DACC = {} & \beta_0 + \beta_1 BRDSIZE + \beta_2 BRDNED + \beta_3 BRDEXP + \\ & \beta_4 BRDMEET + \beta_5 ACSIZE + \beta_6 ACIND + \beta_7 ACEXP + \\ & \beta_8 ACMEET + \beta_9 AQ + \beta_{10} INOWN + \beta_{11} BLOCK + \beta_{11} MTBV + \\ & \beta_{13} LOSS + \beta_{14} CFO + \beta_{15} LEVERGN + \beta_{16} LNASSET + \varepsilon \end{aligned} \tag{9}$$

where

Dependent variable:

DACC	=	*DACCJM*, *DACCMJM* and *DACCROA*

Hypothesis variables:

AQ	=	*LNAFEE, LNNAF, LNTOTALFEES, FEERATIO1, FEERATIO2, SPECLST_MSLEADER, SPECLST_MS30*, *SPECLST_MS*, *SPECLST_PS* and *SPECLST_WEIGHTED*
BRDSIZE	=	the numbers of board' members during the year;
BRDNED	=	the proportion of non-executive directors on board to board size;
BRDEXP	=	the proportion of directors with accounting experience and financial qualification to board size;
BRDMEET	=	the number of board meetings during the year;
ACSIZE	=	the number of audit committee members;
ACIND	=	coded as 1 if audit committee had solely non-executive directors; 0 otherwise;
ACEXP	=	the proportion of audit committee members with accounting experience and financial qualification to audit committee size;
ACMEET	=	the number of audit committee meetings during the year;

Control variables:

INOWN	=	the cumulative percentage of total shares owned by the directors of a firm;
BLOCK	=	the cumulative percentage shares ownership of the blockholders who hold at least 5 percent or more of outstanding common shares and who are unaffiiliated with management;
MTBV	=	the market to book value ratio;
LOSS	=	coded as 1 if the firm had two or more years of negative income, 0 otherwise;
CFO	=	cash flow from operation scaled by lagged total asset;

LEVERG	=	the proportion of debts to total assets;
LNASSET	=	natural logarithm of total assets;

The control variables chosen are relatively similar to those used by Klein (2002) and Bédard et al. (2004), and include *INOWN, BLOCK, MTBV, LOSS, CFO, LEVERG* and *LNASSET.* Most of the prior studies on earnings manipulation find these variables to be significantly correlated with the level of discretionary accruals (e.g. Ferguson et al., 2004; Park and Shin, 2004).

Similar to the NAS fees and industry specialist auditor models, *INOWN* and *BLOCK* are the variables grounded from the agency theory. As the level of insider or managerial ownership increases, they are more closely aligned with the interest of the external shareholders and thus, less likely to pursue opportunistic behaviour at the expenses of the shareholders (Jensen and Meckling, 1976). Evidence suggests that managers with a higher level of ownership are more likely to increase the earnings informativeness and report more reliable earnings (Warfield et al., 1995). This situation arise because they perceive themselves as part of the firm's structure and therefore more responsible for their actions. In agreement with Klein (2002), the present study predicts a negative relationship between *INOWN* and earnings management.

From the perspective of agency theory, the institutional investors or *BLOCK* could be an alternative monitoring incentive. According to Monks and Minow (1995), the institutional investors have the opportunity, resources, ability to monitor, discipline and influence management actions and decisions. When outside ownership is concentrated, such significant and collective shareholdings provide institutional investors with a greater incentive to collect information, to monitor activities and to encourage better performance from the management (Chung et al., 2002). Stated differently, as the cumulative shareholdings of the institutional investors increases, the more likely they are to constrain the management opportunistic behaviour, which in turns resulting lower earnings management. Consistent with this argument and following Klein (2002) and Bédard et al (2004), *BLOCK* is expected to be negatively correlated with the levels of opportunistic earnings.

MTBV is defined as the market-to-book value ratio and used as a proxy for growth opportunities. Skinner and Sloan (2002) and Matsumoto (2002) suggest that the managers of firms with higher growth opportunities face greater pressure to meet earnings targets. Thus, the higher the market-to-book value of equity ratio, the greater the incentive for managers to manipulate earnings. In line with Klein (2002), Collin and Kothari (1989) and Graver and Graver (1993), the present study expects that *MTBV* will be positively related to earnings management.

LOSS is a dichotomous variable, coded as 1 if the firm had two or more years of negative income, 0 otherwise. The firms with negative income may have greater incentive to manage reported earnings in order to survive in the market. Burgstahler and Dichev (1997: 124) claim that 30% to 40% of firms with slightly negative earnings exercise discretion to report positive earning. If the firms report negative earnings they may unable to grant loans and the investors are unfovour towards the negative earnings. This may suggest that the firms with negative income will engage more in earnings management as compared to the firms with positive income, in order to grant loans and promote the shareholders interests. Thus, the current study expects *LOSS* to be positively associates to *DACC*.

CFO is defines as cash flow from the firm'soperation scaled by lagged total assets. The managers with lower cash flow have a higher incentive to manipulate earnings by reporting future revenues or by delaying current costs in order to report they are in well financial condition (Leuz et al., 2003). This argument suggests a negative relationship between *CFO* and *DACC*, consistent with the evidence documented in Becker et al. (1998). Alternatively, the firms with a higher cash flow may also manipulate earnings or unstate the strong performance by creating a reserve for their future needs (Leuz et al., 2003). This is supported by Han and Wang's study (1998). They claim that the petroleum refining firms that benefited from higher oil prices used income-decreasing accruals to mitigate the potential of political risk. In addition, Frankel et al. (2002) argue that firms with a high cash flow are more likely to beat the earnings benchmark. This may suggest a positive relationship between firm performance and earnings management, but the mixed arguments offer no direction for this variable

LEVERG is used as a proxy for debt covenants violation. Press and Weintrop (1990) and Duke and Hunt (1990) claim that a firm with higher leverage is more likely to be associated with the debt covenants violation. This is because as the level of debt increases, the firm may experience tighter accounting constraints, which in turn increases the higher possibility of debt covenant violations. Several studies suggest that in order to avoid violating restrictive debt covenants, the higher leveraged firms are more likely to choose accounting procedures that support income increasing accounting method (Bowen et al., 1981; Dhaliwal et al., 1982). In particular, DeFond and Jiambalvo (1994) suggest that the highly leveraged firms have a greater incentive to make income increasing discretionary accruals in order to avoid debt covenants violation. This may suggest a positive relationship between leverage and earnings management. However, DeAngelo et al. (1994) claim that in a time of financial distress, firms might engage in contractual renegotiations with lenders in order to deliberately reduce reported earnings. Such a situation may suggest a negative relationship between leverage and earnings management. Park and Shin (2004) report a negative relationship between leverage and earnings management for different reasons. They argue that highly leveraged firms might be less likely to manage their earnings because they are under the close scrutiny of their lenders. If the lender has closely monitored the earnings management activities of such a firm, then their earnings management will decrease with financial leverage. As a result of such differing arguments, the direction of this variable is not predicted for the current study.

LNASSET is a proxy for firm size. The larger the firm size, the higher the likelihood that the manager will manipulate the firm's earnings .Watt and Zimmerman (1990) suggest that larger firms are associated with higher political costs, and that there is thus a higher incentive to manipulate reported earnings in order to mitigate potentially adverse political actions. Evidence from other prior studies also suggests a positive relationship between size and earnings management (Becker et al., 1998; DeFond and Park, 1997). However, Park and Shin (2004) provide an alternative argument. They claim that larger firms are followed by the external capital market, and are therefore less able to hide earnings manipulation because they are closely monitored by the press and by analysts. This suggests a negative relationship between *LNASSET* and

DACC. The mixed arguments propose no clear direction regarding the association between *LNASSET* and *DACC*.

4.6 Data analysis procedures

To analyse the data, the statistical software STATA 11 is used. The data analysis includes descriptive statistics, the correlation matrix, multivariate regression and robustness tests. Each of these is now reviewed.

4.6.1 Descriptive statistics and correlation matrix

Descriptive statistics describes the sample data on a single variable in an organised form. It includes the mean, median, standard deviation, minimum, maximum, skewness, kurtosis, first quartile and third quartile. The mean, median, first quartile, third quartile and standard deviation measure the central tendency of the variable. The skewness and kurtosis explain the shape of the data distribution. Specifically, the skewness measures the symmetry of distribution while kurtosis measures the peakedness or flatness of the distribution (height), as compared to normal distribution (Hair et al., 2010:35-36). In addition to descriptive statistics, when the dependent variables are dichotomous and can be regarded as 'low' or 'high' groups, univariate analyses will be performed to test the mean differences between these two groups.

The correlation among the variables is shown by pairwise correlation matrix. This explains the degree of linear association between two variables and ranges from +1 to -1, where a correlation of ±1 means that there is a perfect linear relationship between the variables. However, according to Hair et al. (2010: 200), a higher degree of intercorrelation among the independent variables may cause problems of multicollinearity when the correlation coefficient is above ±0.90. Multicolinearity may substantially effect the predictive ability of the regression model as well as the estimation of the regression coefficients.

4.6.2 Multivariate regression

Most of the multivariate regression in the prior literature used ordinary least square regression (hereafter OLS) to examine the relationship between a single dependent variable and several independent variables (predictors). However, there are five fundamental assumptions to be fulfilled in order for the OLS regression model to be valid (Chen et al., 2003; Gujarati, 2003; Hair et al., 2010). These assumptions include:

(1) Normality - The errors (residuals) should be normally distributed

(2) Linearity - The relationship between the predictors and the response variable should be linear.

(3) Homoscedasticity - The error variance should be constant

(4) Independent - The errors associated with one observation should not be correlated with the errors of other observations.

(5) Multicollinearity - There should be no exact collinearity among predictors.

In addition to these assumptions, Chen et al. (2006) suggest that the analyst consider any unusual and influential data that may substantially change the estimation of coefficients. When these assumptions are violated, the results of OLS regression may be distorted and biased (Chen et al., 2003; Gujarati, 2003; Hair et al., 2010).

Several regression estimators, such as least square regression with robust standard error, weighted least square regression (sometimes known as generalized least square regression or GLS), robust regression, and quantile regression provide an alternative to OLS regression when the assumptions have been violated. For example, when the normality assumption has not been fulfilled, and in the presence of moderate outliers, robust regression (iteratively reweighted least squares) provides better estimation than OLS regression (Hamilton, 1999; Chen et al., 2003). In the presence of heteroscedasticity and serial correlation, either the least square estimator with robust standard error (Huber-White standard errors) or GLS regressions are able to reweight the error variance and thus to correct heteroscedasticity and autocorrelation (Adkins and Hill, 2007: 196; Gujarati, 2003: 387). In addition to these, non-parametric regression, such as quantile regression disregards all the OLS assumptions (Gujarati, 2003).

In general, the present study finds that most of the OLS assumptions are not adequately fulfilled, even though several steps have been taken to conform to these assumptions (by using data transformation, for example). In the prior literature, many statisticians agree that mild violations of the OLS assumptions are robust and unaffected in many situations (Box, 1953; 1954; Glass and Hopkins, 1984; Glass et al., 1972; Newman et al., 1989). Thus, in the main analysis of this study, most models have been analysed using OLS regression, except the heteroscedastic models, where the use of OLS regression would be questionable. Where the models reveal pronounced heteroscedasticity, the analysis will be performed using the least square estimator with robust standard error. This regression estimates the standard errors using the Huber-White sandwich. It can be interpreted in the same manner as OLS regression, but is more precise and efficient than the OLS estimator and able to correct heteroscedasticity and autocorrelation (Adkins and Hill, 2007). In the sensitivity analysis, the alternative regression estimators such will be reported as a benchmark for comparison.

OLS regression is applicable when the dependent variable is continuous variable. However, when the dependent variable is a dichotomous variable, OLS regression may not be able to fulfil the OLS assumptions and may thus lead to inefficient estimation (Pampel, 2000; Menard, 2002). Thus, transforming the dichotomous variable into a logit or probit model may overcome the inefficiency. As pointed out by Menard (2002: V):

> "… with a dichotomous dependent variable, assumptions of homoskedasticity, linearity, and normality are violated, and OLS estimates are inefficient at best. The maximum likelihood estimation of a logistic regression overcomes this inefficiency, transforming Y (1, 0) into a logit (log of the odds of falling into the '1' category)."

Therefore, taking into account these circumstances, when the dependent variable is dichotomous, multivariate regression is estimated using the heteroskedastic ordinal regression as a control for heteroscedasticity (Williams, 2009). In the sensitivity analysis, probit regression is used as an alternative estimator. According to Pampel (2000: 54) logit and probit regression give essentially similar results and it is up to the researcher to choose between these two estimators.

4.6.3 Further analysis and robustness test

Several tests were performed after the multivariate regression analysis. The purpose of these additional tests was to give reasonable assurance that the main findings were robust to the various model specifications. The robustness tests include tests for multicollinearity and heteroscedasticity, various regression estimators, client size analysis, various definitions of corporate governance characteristics, and tests for additional control variables and endogeneity.

4.7 Summary

The sample population for this thesis is the largest 350 firms listed on the LSE, giving an initial sample of 1,400 firm-year observations over the period 2005 to 2008. After eliminating regulated firms, firms with missing information and firms not audited by the Big 4 auditors, the final sample consisted of 674 and 613 firm-year observations for two empirical investigations. The data was gathered from *Datastream*, *FAME*, *Thomson One Banker* and the firms' annual reports. The computation and description of three main groups of hypothesis variables have been explained in this chapter: (1) the characteristics of the board of directors and the audit committee (e.g. size, composition, expertise and level of activities), (2) the audit quality proxies (e.g. audit fees, NAS fees and industry specialist auditors), and (3) earnings management. This has been followed by a discussion of the model specifications and related control variables. Table 4.6 presents a summary of the variables used in the current study. Most of the analyses employed OLS regression and the least square estimator with robust standard error (Huber-White sandwich).

Table4.6: Summary of all variables used			
Variable	Label	Description	Data source
Board of directors size	*BRDSIZE*	the numbers of board' members during the year;	Annual report
Board of director composition	*BDRNED*	the proportion of non-executive directors on board to board size;	Annual report
Board of directors expertise	*BRDEXP*	the proportion of directors with accounting experience and financial qualification to board size;	Annual report
Board of directors meeting	*BRDMEET*	the number of board meetings during the year;	Annual report
Audit committee size	*ACSIZE*	the number of audit committee members;	Annual report
Audit committee composition	*ACIND*	coded as 1 if audit committee had solely non-executive directors; 0 otherwise;	Annual report

Table4.6 (continued)			
Audit committee expertise	*ACEXP*	the proportion of audit committee members with accounting experience and financial qualification to audit committee size;	Annual report
Audit committee meeting	*ACMEET*	the number of audit committee meetings during the year;	Annual report
Audit fees	*LNAFEE*	the natural log of audit fees	*FAME*
NAS fees	*LNNAF*	natural log of NAS fees;	*FAME*
NAS fees	*LNTOTALFEES*	natural log of the sum of audit and NAS fees	*FAME*
NAS fees	*FEERATIO1*	the fee ratio of NAS fees to total fees	*FAME*
NAS fees	*FEERATIO2*	the fee ratio of NAS fees to audit fees	*FAME*
Industry specialist auditors	*SPECLST_ MSLEADER*	coded as 1 if the auditor earned the largest market share in each particular industry, 0 if otherwise;	*FAME*
Industry specialist auditors	*SPECLST_MS30*	coded as 1 if the auditor' market share exceed 30 percent in each particular industry, 0 if otherwise;	*FAME*
Industry specialist auditors	*SPECLST_MS*	continuous variable which equals to the respective auditor' market share;	*FAME*
Industry specialist auditors	*SPECLST_PS*	continuous variable which equals to the respective auditor' portfolio share	*FAME*
Industry specialist auditors	*SPECLST_ WEIGHTED*	continuous variable which equals to the compliment between auditor' market share (*SPECLST_MS*) and portfolio share *(SPECLST_PS)*	*FAME*
Earnings management	*DACCJM*	discretionary accrual based on Jones Model;	*Datastream*
Earnings management	*DACCMJM*	discretionary accruals based on Modified Jones model;	*Datastream*
Earnings management	*DACCROA*	discretionary accruals by Kothari et al. (2005), including lagged ROA in the accrual regression to control for firm performance;	*Datastream*
Consolidated subsidiaries	*SQSUBS*	the square root of total consolidated subsidiaries;	*Datastream*
Foreign subsidiaries	*FORGN*	the proportion of foreign subsidiaries to total consolidated subsidiaries;	*Datastream*
Ratio of account receivable and inventory to total asset	*RECINV*	the proportion of total assets in account receivable and inventory;	*Datastream*

Table4.6 (continued)			
Leverage	*LEVERG*	the proportion of debts to total assets;	*Datastream*
Total asset	*LNASSET*	the natural logarithm of total assets;	*Datastream*
Board of director ownership	*INOWN*	the cumulative percentage of total shares owned by the directors of a firm;	Annual report
Blockholder ownership	*BLOCK*	the cumulative percentage shares ownership of the blockholders who hold at least 5 percent or more of outstanding common shares and who are unaffiiliated with management;	Annual report
Stock return	*RETURN*	the fiscal year total stock return;	*Datastream*
Number of acquisition	*ACQ*	the number of acquisitions made by the company during the year;	*Thomson One Banker*
New shares or debt for cash	*NWFUND*	coded as 1 if the firm issued new shares or debt for cash during the year, 0 otherwise;	Annual report
New external director	*NEWDIR*	coded as 1 if the firm appoint new external director during the year, 0 otherwise;	Annual report
Restructuring	*RESTR*	coded as 1 if the restructuring program has occurred during the year, 0 otherwise;	Annual report
New debt and equity	*NWFUNDRATIO*	proceed from new debt and equity issuances/ total assets;	Annual report and *Datastream*
Return on assets	*ROA*	return on assets;	*Datastream*
Foreign sale	*FORGNSALE*	the proportion of the firm' foreign sales.	*Datastream*
Growth	*MTBV*	the market to book value ratio;	*Datastream*
Firm performance	*LOSS*	coded as 1 if the firm had two or more years of negative income, 0 otherwise;	*Datastream*
Cash flow	*CFO*	cash flow from operation scaled by lagged total asset;	*Datastream*
Liquidity	*LIQ*	ratio of current assets divided by current liabilities;	*Datastream*
Sales growth	*GROWTH*	growth rate in sales over the previous fiscal year;	*Datastream*

CHAPTER 5

FINDINGS AND DISCUSSIONS: THE BOARD OF DIRECTORS, AUDIT COMMITTEE AND AUDIT QUALITY

5.1 Introduction

This chapter presents the results for the first empirical analysis of the characteristics of boards of directors and audit committees and their relationship to audit quality. There are three proxies of audit quality to be examined, namely the audit fees, the NAS fees and the use of industry specialist auditors.

This chapter is organised as follows: the next section presents the descriptive statistics and correlation matrix. This is followed by a separate section on research design, multivariate results and a sensitivity analysis of each proxy. The last section summarises and concludes the chapter.

5.2 Descriptive statistics

Table 5.1 present the descriptive statistics of three measures of audit quality- audit fees *(LNAFEE*), NAS or auditor independence measures *(LNNAF*, *LNTOTALFEES, FEERATIO1*, *FEERATIO2)* and auditor industry specialist measures *(SPECLST_MSLEADER*, *SPECLST_MS30*, *SPECLST_MS*, *SPECLST_PS*, *SPECLST_WEIGHTED*, the hypothesis variables *(BRDSIZE*, *BRDNED*, *BRDEXP*, *BRDMEET, ACSIZE, ACIND, ACEXP*, *ACMEET)* and the related control variables containing mean, median, standard deviation, minimum and maximum, skewness and kurtosis. The following are important descriptive statistics to highlight.

The mean (median) of audit fees and NAS fees for 674 firm-years are £1.466 million (£0.805 million) and £1.296 million (£0.600 million) respectively. The mean (median) of total fees is £2.762 million (£1.521 million). The NAS fees captured almost 50% of total audit fees. In a previous UK study, O' Sullivan (2000) reported that the mean (median) of audit fees and NAS fees for the 402 largest firms in the fiscal year of 1992 are £0.638 million (£0.279 million) and £0.320 million (£0.144 million) respectively. As compared to O'Sullivan (2000), audit fees have increased about 130% and the NAS fees of UK firms have grown by about 305%, suggesting the importance of NAS as an alternative source of income for auditors in addition to auditing services. These figures support the argument that NAS seems to be associated with luxury income as it contains a higher profit margin than audit fees (Lee, 2008). The mean (median) ratio of NAS fees to total fees *(FEERATIO1)* and ratio of NAS fees to total audit fees *(FEERATIO2)* are 0.418 (0.400) and 1.0810 (0.667) respectively. Under the *SPECLST_MSLEADER* and *SPECLST_MS30* definitions, 40.6% and 50% of firms, respectively, have engaged the services of an industry specialist auditor.

For board of director variables, the average board size is 9, which is relatively consistent with the figure reported in Peasnell et al. (2005) who report that the average board size was 8. The average proportion of independent non-executive directors on boards is 46%.[46] The average proportion of boards of directors with accounting or financial qualifications and experience is 35% and the average frequency of board meetings is 8 times a year. This can be compared to the US studies of Abbott et al. (2003) and Carcello et al. (2002) who report that the proportions of independent non-executive directors on boards are 68% and 75% respectively, and that on average board meetings are held 7 times a year.[47] This comparison implies that firms in the US are more likely to be dominated by independent non-executive directors, while in the UK, board members have an almost balanced representation of executive and independent non-executive directors. The board meeting frequencies are relatively similar.

With regard to audit committee's variables, the mean (median) audit committee size is 3.635 (3.000). 72.2% of the samples report that their audit committees are made up of solely independent non-executive directors with an average of 39% of them having accounting and financial expertise; or at least 93% of the samples had one member with financial expertise. The average frequency of audit committee meetings is 4

[46] Using the 1992 data from 402 of the largest UK firms, O'Sullivan (2000) reports that the percentage of non-executive directors on boards was 41%. Similarly, Peasnell et al (2005), report that the percentage of non-executive director on boards in their sample was 43%. However, both studies do not mention whether they include the grey or affiliated directors.

[47] Abbott et al. (2003) and Carcello et al. (2002) define the independent non-executive directors as non-employee directors while the present study measures the independence of non-executive directors more specifically using the definition outlined in the UK Corporate Governance Code (2010).

times a year. In US, Abbott et al. (2003) report that 75% of their samples had audit committees that were composed of solely independent non-executive directors and 80% had at least one financial expert.[48] This suggests that the proportion of firms with a percentage of solely independent audit committee members are relatively similar in the US and the UK but that the proportion of firms that have at least one audit committee equipped with financial expertise in the UK are relatively higher than is reported in the US. One of the possible reasons for this is because the sample represented in this study comprised current data where the board and audit committee system in the UK is already established, following the recommendations set out in the UK Combined Code in July 2003.

The mean (median) of the cumulative percentage of total shares owned by the director *(INOWN)* and the blockholders *(BLOCK)* are 4.201% (0.230%) and 23.159% and (20.64%) respectively. In an earlier UK study, O'Sullivan (2000) reported that the mean (median) of shares owned by the directors was 5.55% (0.291%), while the figures for shares owned by external shareholders were about 31.292% (21.640%).[49] The mean (median) of *INOWN* is relatively similar but the mean (median) of *BLOCK* is relatively lower than reported by O'Sullivan (2000). The inconsistent mean (median) may be due to different definitions of variables. The present study defines *BLOCK* as the blockholders holding at least at 5% of the shares and O'Sullivan (2000) defines this at 3% of the shares. Allowing for the time difference from the previous UK study, it shows that there was not much change in the directors' ownership pattern.

The mean (median) of total assets is 4,337 (1,379) millions. In natural logarithm form, the mean (median) of *LNASSET* is 6.174 (6.129) of which 29.7% are represented by the account receivable and inventories. The mean (median) of *FORGNSALE* is 45.631 (50.205), which captured nearly half of the total sales made by the 674 firms.

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[48] Abbott et al (2003) examined data 2001.

[49] O'Sullivan split the directors' shares into executive and nonexecutive directors and the block shareholders into institutional and external shareholders. To make a comparison the present study adds the mean and median of the respective variables.

The mean (median) for leverage is 64% (64.2), which is relatively higher than that reported in Australia. Chen et al. (2005) report that the mean (median) leverage of 458 Australian firms is 48.84% (44.42%). The higher leverage figures may suggest that the firms in the UK have higher risk levels than firms in Australia. In terms of firm's performance, the mean (median) of *ROA* is 9.744 (8.34).

The mean (median) of fiscal year stock returns is 12.853 (7.477). For corporate acquisition *(ACQ)* the mean (median) is 1.195 (1.000), approximately and on average every firm will acquire one firm. Previously, Fifth (1997) reported that, for the 500 largest British industrial firms in 1993 (listed firms ranked in *The Times 1000*), the means of *RETURN* and *ACQ* are 0.43 and 0.13 respectively. While Abbott et al. (2003b) reported that the means of these variables are 0.0415 and 0.2402 respectively. Compared to prior studies, the means of *RETURN* and *ACQ* that are documented in the present study are relatively higher. This difference may be due the sample variations. The firms listed in *The Times 1000* and the sample examined by Abbott et al (2003b) probably contained both the largest and the smaller firms. The present study examined the largest 350 firms listed in LSE, thus, on average, the largest firms may have a more stable stock market return and a higher number of acquisitions than smaller firms.

NEWFUND, *NEWDIR* and *RESTR* are dichotomous variables. These variables are associated with special events that demand NAS. The means of these variables are 0.922, 0.472 and 0.409 respectively. Specifically, there are 642 firm-years in which new shares or debt for cash was issued, 318 firm-years in which new directors were appointed and 276 firm-years in which a restructuring program took place. Fifth (1997) and Abbott et al. (2003b) reported that the means of these variables are 0.11and 0.0851for *ISSUE,* 0.09 and 0.0408 for *NEWDIR,* and 0.05 and 0.0887 for *RESTR* respectively.

The mean and median of the total number of consolidated subsidiaries are 26.866 and 20 respectively, and about 52.2% of them are foreign subsidiaries. The previous UK and Australian studies, O'Sullivan (2000) and Chen et al (2005) report that the overall numbers of subsidiaries in their samples are 23.686 and 27.72 respectively. This suggests that the levels of firms' complexities in the UK and Australia are relatively similar.

As shown in the skewness and kurtosis columns in Table 5.2, most of the variables are not normally distributed. The normal distribution takes a value of 0, and values above and below 0 denote departures from normality. To reach the normal distribution, several variables are been transformed (e.g. *LNAFEE, SQSUBS, LNASSET*) using the natural log and the square root. One possibility that violates the normality assumption may cause the heteroscedasticity problem. Diagnostics on the heteroscedasticity problem will be provided in a later section.

5.3 Correlation matrix

The correlation matrix for all the variables used in the audit quality models is presented in Table 5.2. The hypotheses variables and related control variables are measured by three proxies of audit quality, namely audit fees *(LNAFEE*), auditor independence measurements *(LNNAF, LNTOTALFEES, FEERATIO1* and *FEERATIO2)* and auditor industry specialist measurements *(SPECLST_MSLEADER, SPECLST_MS30, SPECLST_MS, SPECLST_PS* and *SPECLST_WEIGHTED).* Higher correlations among audit quality measurements are always expected since they are highly interrelated. Only one measure of audit quality will be included in a single empirical test so that this higher correlation does not necessarily influence the empirical results.

In general, the overall correlation matrix shows that each of the audit quality measures with all variables (i.e. board of directors, audit committee and related control variables) are moderately inter-correlated with one and another except for variables *LNAFEE* and *LNTOTALFEES* with *LNASSET* (correlation coefficients of 74.6% and 72.5% respectively) and *FORGN* with *FORGNSALE* (correlation coefficients of 71.3%), which have the largest correlation coefficients above 50%.[50] The main concern arising from the largest correlations is that they may indicate a multicollinearity problem in the empirical model. Diagnostics on the multicollinearity

[50] The highest correlation coefficient between *FORGN* and *FORGNSALE* is not critical because these variables are associated with different model specifications. *FORGN* is one of the control variables for the audit fees model while *FORGNSALE* is a control variable for the auditor industry specialist model.

that is associated with each empirical model will be provided later in the section on additional analyses.

LNAFEE is significantly correlated with all board and audit committee variables except for *BRDMEET*. The range of the correlation coefficient is between -8.9% and 46.7%. *LNAFEE* is significantly and positively correlated with *BRDSIZE* and *BRDNED* but negatively correlated with *BRDEXP*. A positive correlation between *BRDNED* and *LNAFEE* is consistent with Abbott et al. (2003a) and Carcello et al.'s (2002) studies. *LNAFEE* is significantly and positively correlated with *ACSIZE, ACIND* and *ACMEET* (correlation coefficients of 41.4%, 10.6% and 33.7% respectively), suggesting that the firms with a larger audit committee made up solely of independent members and having more meetings are correlated with higher audit fees. These correlations are consistent with the findings of Abbott et al. (2003a).[51] However, the *ACEXP* is found to be negatively correlated with *LNAFEE (*at p<0.05), and this is consistent with the correlation reported by Krishnan and Visvanathan (2009).

LNNAF and *LNTOTALFEES* are found to be significantly correlated with most of the board and audit committee variables when compared to *FEERATIO1* and *FEERATIO2*. *LNNAF* and *LNTOTALFEES* are positively correlated at p<0.01 with *BRDSIZE* and *BRDNED*. Their correlation coefficients are 31.0% and 46.6% respectively. A positive correlation between *LNNAF* and *BRDNED* is consistent with O'Sullivan (2000). *BRDEXP* is significantly and negatively correlated with *LNNAF* and *LNTOTALFEES* (correlation coefficients are -10.6% and -16.7% respectively), indicating that the firms with a higher proportion of board members with financial expertise are likely to report lower NAS fees and total fees. *BRDMEET* is insignificantly correlated with *LNNAF* and *LNTOTALFEES.* None of the board of director variables is significantly correlated with *FEERATIO1* and *FEERATIO2. ACSIZE* and *ACIND* are significantly and positively correlated with *LNNAF* and *LNTOTALFEES* but *ACSIZE* is found to be negatively correlated with *FEERATIO2*

[51]Except for audit committee size, Abbott et al. (2003a) was not examined this variable.

The correlation coefficients of the board and audit committee variables with the auditor industry specialist measures are mixed, depending on how the auditor industry specialist data has been computed. They either marginally correlated in the opposite directions or insignificantly correlated with board and audit committee variables. For example, *BRDSIZE* is found to be significantly and positively correlated with all the auditor industry specialist measures except for *SPECLST_PS*, which is found to be insignificantly correlated with *BRDSIZE*. *BRDEXP* is negatively correlated with *SPECLST_MS, SPECLST_MSLEADER* and *SPECLST_MS30* (correlation coefficients are -10.0%, -14.4%, -7.8% respectively) but it is positively correlated with *SPECLST_PS* (the correlation coefficient is 7.8%). *BRDNED* is insignificantly correlated with all the auditor industry specialist measures. For audit committee variables, *ACSIZE* is significantly and negatively correlated with *SPECLST_PS* but it is positively correlated with *SPECLST_PS, SPECLST_MSLEADER* and *SPECLST_MS30. ACIND* is found to be positively and significantly correlated only with *SPECLST_PS, SPECLST_WEIGHTED,* and *SPECLST_MS30. ACEXP* and *ACMEET* are positively correlated with *SPECLST_PS.*

Table 5.1: Descriptive statistics (*N*=674)							
Variables	Mean	Median	Standard Deviation	Minimum	Maximum	Skewness	Kurtosis
Audit fees (£'000)	1466.024	805.500	1920.880	70.000	17000.000	3.320	18.201
NAS fees (£'000)	1296.004	600.000	2058.770	0.000	25000.000	4.579	37.131
Total fees (£'000)	2762.028	1521.000	3631.154	117.000	30000.000	3.279	17.411
LNAFEE	2.920	2.906	0.456	1.845	4.230	0.203	2.606
LNNAF	2.699	2.778	0.729	0.000	4.397	-1.309	6.406
LNTOTALFEES	3.189	3.182	0.466	2.068	4.477	0.137	2.635
FGEERATIO1	0.418	0.400	0.199	0.000	0.917	0.212	2.589
FEERATIO2	1.080	0.667	1.307	0.000	11.113	3.661	21.792
SPECLST_MS	0.349	0.321	0.215	0.015	0.903	0.704	2.835
SPECLST_PS	0.170	0.133	0.147	0.003	0.537	1.037	3.239
SPECLST_WEIGHTED	0.064	0.045	0.064	0.000	0.228	1.172	3.281
SPECLST_MSLEADER	0.407	0.000	0.492	0.000	1.000	0.381	1.145
SPECLST_MS30	0.540	1.000	0.499	0.000	1.000	-0.161	1.026
BRDSIZE	9.202	9.000	2.299	5.000	19.000	1.101	4.377
BRDNED	0.457	0.455	0.116	0.052	0.778	-0.337	3.466
BRDEXP	0.352	0.333	0.142	0.083	0.857	0.529	2.959
BRDMEET	8.637	8.000	2.584	3.000	21.000	0.972	5.392
ACSIZE	3.635	3.000	0.838	3.000	8.000	1.528	6.015

Table 5.1 (continued)							
Variables	Mean	Median	Std. Deviation	Minimum	Maximum	Skewness	Kurtosis
ACIND	0.722	1.000	0.448	0.000	1.000	-0.994	1.988
ACEXP	0.388	0.333	0.209	0.000	2.000	1.089	8.109
ACMEET	4.009	4.000	1.212	2.000	10.000	1.483	6.563
INOWN	4.201	0.231	12.221	0.002	147.525	5.076	39.416
BLOCK	23.159	20.64	16.081	0.000	76.120	0.832	3.550
LEVERG	0.640	0.642	0.217	0.056	2.055	0.773	7.215
RETURN	12.852	7.477	16.053	-0.939	179.763	3.448	24.270
SQSUBS	4.702	4.472	2.076	0.000	17.321	1.189	6.434
FORGN	0.524	0.632	0.338	0.000	0.987	-0.358	1.618
LNASSET	6.174	6.129	0.567	4.516	8.122	0.533	3.334
FORGNSALE	45.631	50.205	35.853	0.000	215.62	0.137	2.204
RECINV	0.293	0.264	0.204	0.003	1.022	1.105	4.295
ACQ	1.196	1.000	1.196	0.000	16.000	3.564	22.070
NWFUND	0.922	1.000	0.267	0.000	1.000	-3.169	11.045
NWFUNDRATIO	0.132	0.035	0.500	0.000	9.511	14.757	88.208
NEWDIR	0.472	0.000	0.500	0.000	1.000	0.113	1.013
RESTR	0.409	0.000	0.492	0.000	1.000	0.368	1.135
ROA	9.744	8.34	9.118	-54.44	70.08	0.868	14.755

Table 5.1 (continued)
LNAFEE= the natural log of audit fees; *LNNAF*=natural log of NAS fees; *LNTOTALFEES*=natural log of the sum of audit and NAS fees; *FEERATIO1*= the fee ratio of NAS fees to total fees; *FEERATIO2*= the fee ratio of NAS fees to audit fees; *SPECLST_MS*= continuous variable which equals to the respective auditor' market share; *SPECLST_PS*= continuous variable which equals to the respective auditor' portfolio share; *SPECLST_WEIGHTED*= continuous variable which equals to the compliment between auditor' market share (*SPECLST_MS*) and portfolio share *(SPECLST_PS); SPECLST_MSLEADER*= coded as 1 if the auditor earned the largest market share in each particular industry, 0 if otherwise; *SPECLST_PSTOP3*= coded as 1 if the incumbent auditor earned the highest top three portfolio shares and 0 if otherwise, and *SPECLST_MS30*= coded as 1 if the auditor' market share exceed 30 percent in each particular industry, 0 if otherwise ; *BRDSIZE*=the numbers of board' members during the year; *BDRNED*=the proportion of non-executive directors on board to board size; *BRDEXP*=the proportion of directors with accounting experience and financial qualification to board size; *BRDMEET*= the number of board meetings during the year; *ACSIZE*= the number of audit committee members; *ACIND*= coded as 1 if audit committee had solely non-executive directors; 0 otherwise; *ACEXP*= the proportion of audit committee members with accounting experience and financial qualification to audit committee size; *ACMEET*= the number of audit committee meetings during the year; *INOWN*=the cumulative percentage of total shares owned by the directors of a firm; *BLOCK*= the cumulative percentage shares ownership of the blockholders who hold at least 5 percent or more of outstanding common shares and who are unaffiiliated with management; *LEVERG*=the proportion of debts to total assets; *RETURN*= the fiscal year total stock return; *SQSUBS*= the square root of total consolidated subsidiaries; *FORGN*=the proportion of foreign subsidiaries to total consolidated subsidiaries; *LNASSET*= the natural logarithm of total assets; *FORGNSALE*= proportion of the firm' foreign sales; *RECINV*= the proportion of total assets in account receivable and inventory; *ACQ*= the number of acquisitions made by the company during the year; *NWFUND* = coded as 1 if the firm issued new shares or debt for cash during the year, 0 otherwise; *NWFUNDRATIO*= proceed from new debt and equity issuances/ total assets; *NEWDIR*=coded as 1 if the firm appoint new external director during the year, 0 otherwise; *RESTR*= coded as 1 if the restructuring program has occurred during the year; *ROA*= return on assets.

Table 5.2: Pairwise correlation matrix (*N*=674)												
Variable		A	B	C	D	E	F	G	H	I	J	K
A	*LNAFEE*	1.000										
B	*LNNAF*	**0.552**	1.000									
C	*LNTOTALFEES*	**0.919**	**0.756**	1.000								
D	*FEERATIO1*	**-0.113**	**0.637**	**0.273**	1.000							
E	*FEERATIO2*	**-0.165**	**0.413**	**0.211**	**0.805**	1.000						
F	*SPECLST_MS*	**0.244**	**0.140**	**0.234**	0.000	-0.023	1.000					
G	*SPECLST_PS*	**0.172**	0.057	**0.128**	*-0.099*	*-0.091*	**0.161**	1.000				
H	*SPECLST_WEIGHTED*	**0.212**	**0.109**	**0.183**	-0.057	-0.065	**0.504**	**0.883**	1.000			
I	*SPECLST_MSLEADER*	**0.206**	*0.098*	**0.190**	-0.018	-0.038	**0.799**	**0.395**	**0.657**	1.000		
J	*SPECLST_MS30*	**0.271**	**0.147**	**0.241**	-0.039	*-0.076*	**0.776**	**0.400**	**0.628**	**0.764**	1.000	
K	*BRDSIZE*	**0.475**	**0.310**	**0.466**	0.017	-0.008	**0.261**	-0.063	*0.077*	**0.231**	**0.224**	1.000
L	*BRDNED*	**0.467**	**0.310**	**0.453**	0.013	-0.021	0.019	0.026	0.015	0.037	0.058	0.062
M	*BRDEXP*	**-0.167**	**-0.106**	**-0.167**	-0.011	-0.005	**-0.100**	*0.077*	-0.025	**-0.144**	*-0.078*	**-0.362**
N	*BRDMEET*	-0.022	-0.019	-0.003	0.033	0.052	**-0.110**	*0.098*	0.034	-0.043	-0.027	**-0.138**
O	*ACSIZE*	**0.414**	**0.207**	**0.375**	-0.054	*-0.085*	**0.145**	*-0.098*	-0.025	**0.126**	**0.131**	**0.451**
P	*ACIND*	**0.106**	*0.084*	*0.096*	-0.012	-0.027	0.039	**0.115**	*0.087*	0.027	*0.080*	-0.012
Q	*ACEXP*	*-0.089*	-0.050	*-0.078*	0.014	0.039	-0.031	*0.089*	0.044	-0.052	0.036	-0.066
R	*ACMEET*	**0.337**	**0.271**	**0.361**	*0.090*	0.069	-0.027	-0.016	-0.022	0.004	-0.040	**0.230**
S	*INOWN*	**-0.164**	-0.034	**-0.120**	0.074	**0.140**	*-0.083*	-0.007	0.029	-0.043	**-0.104**	-0.025

Table 5.2 (continued)												
Variable		A	B	C	D	E	F	G	H	I	J	K
T	*BLOCK*	**-0.172**	-0.060	**-0.126**	*0.078*	**0.134**	-0.023	**-0.103**	*-0.092*	-0.031	-0.053	0.010
U	*LEVERG*	**0.200**	*0.090*	**0.178**	-0.044	-0.039	0.069	**0.105**	**0.118**	0.052	**0.099**	*0.092*
V	*RETURN*	-0.011	0.015	-0.017	0.006	-0.034	0.444	-0.062	*-0.097*	*-0.082*	*-0.090*	-0.014
W	*SQSUBS*	**0.406**	**0.226**	**0.364**	-0.061	*-0.097*	*0.083*	**0.227**	**0.199**	*0.085*	**0.122**	**0.203**
X	*FORGN*	**0.481**	**0.253**	**0.421**	**-0.113**	**-0.103**	*0.084*	**0.167**	**0.116**	0.072	*0.084*	**0.179**
Y	*LNASSET*	**0.746**	**0.458**	**0.725**	0.016	-0.046	**0.235**	-0.051	0.067	**0.192**	**0.218**	**0.504**
Z	*FORGNSALE*	**0.470**	**0.257**	**0.425**	-0.070	*-0.077*	0.070	**0.189**	**0.136**	0.059	**0.120**	**0.174**
AA	*RECINV*	**-0.172**	**-0.172**	**-0.200**	*-0.099*	-0.043	**-0.106**	0.028	0.002	**-0.128**	**-0.124**	**-0.155**
AB	*ACQ*	**0.246**	**0.111**	**0.218**	-0.055	-0.058	0.062	**0.155**	**0.131**	*0.082*	**0.120**	**0.120**
AC	*NWFUND*	**0.126**	0.053	*0.084*	*-0.078*	**-0.119**	-0.053	-0.016	-0.055	*-0.089*	-0.066	0.028
AD	*NWFUNDRATIO*	-0.030	0.000	-0.008	0.038	0.057	-0.054	*-0.087*	*-0.083*	-0.046	-0.072	-0.043
AE	*NEWDIR*	0.065	*0.078*	*0.086*	0.060	0.047	*0.077*	-0.067	-0.024	0.029	0.049	*0.098*
AF	*RESTR*	**0.251**	**0.216**	**0.265**	0.068	0.014	-0.037	0.003	-0.028	*-0.093*	-0.006	**0.111**
AG	*ROA*	*-0.096*	-0.044	**-0.103**	-0.013	-0.007	0.014	0.025	0.009	0.019	-0.013	-0.056

Table 5.2 (continued)												
Variable		L	M	N	O	P	Q	R	S	T	U	V
L	*BRDNED*	1.000										
M	*BRDEXP*	0.003	1.000									
N	*BRDMEET*	**0.139**	0.010	1.000								
O	*ACSIZE*	**0.363**	**-0.211**	-0.012	1.000							
P	*ACIND*	**0.446**	*0.086*	**0.121**	0.023	1.000						
Q	*ACEXP*	-0.045	**0.586**	-0.041	**-0.229**	*0.080*	1.000					
R	*ACMEET*	**0.263**	-0.036	**0.220**	**0.160**	0.024	-0.059	1.000				
S	*INOWN*	**-0.170**	-0.025	**-0.192**	**-0.100**	*-0.091*	0.003	**-0.133**	1.000			
T	*BLOCK*	**-0.121**	0.012	*-0.093*	**-0.129**	-0.065	*0.073*	*-0.092*	0.064	1.000		
U	*LEVERG*	0.074	0.024	**0.182**	0.049	*0.087*	0.024	*0.089*	**-0.168**	-0.072	1.000	
V	*RETURN*	*0.079*	*0.089*	-0.019	0.036	0.054	**0.101**	-0.042	-0.005	0.040	*0.078*	1.000
W	*SQSUBS*	0.070	0.055	-0.028	**0.134**	0.036	0.004	*0.094*	-0.055	-0.043	*0.089*	0.009
X	*FORGN*	**0.203**	0.019	**-0.145**	**0.127**	0.066	0.023	**0.148**	0.038	0.018	**-0.109**	0.047
Y	*LNASSET*	**0.432**	**-0.218**	0.034	**0.416**	0.053	**-0.115**	**0.336**	**-0.149**	**-0.227**	0.059	*-0.092*
Z	*FORGNSALE*	**0.168**	-0.023	**-0.173**	**0.139**	-0.037	0.056	**0.128**	0.022	-0.023	**-0.140**	-0.016
AA	*RECINV*	*-0.087*	0.044	-0.037	*-0.098*	0.066	-0.017	**-0.126**	0.014	-0.040	-0.001	0.050
AB	*ACQ*	**0.103**	-0.011	0.016	0.003	**0.099**	0.022	-0.046	-0.060	**-0.103**	*0.082*	0.022
AC	*NWFUND*	-0.008	-0.005	0.035	0.000	-0.043	*-0.085*	0.030	**-0.153**	-0.018	0.038	-0.045
AD	*NWFUNDRATIO*	-0.019	0.054	0.028	-0.047	0.006	0.043	0.023	-0.000	0.022	-0.035	-0.022
AE	*NEWDIR*	**0.147**	0.052	-0.015	**0.142**	0.015	0.057	0.050	-0.057	-0.035	0.031	0.008
AF	*RESTR*	**0.131**	0.002	-0.024	**0.125**	0.044	-0.008	**0.151**	**-0.105**	-0.039	0.060	*0.097*
AG	*ROA*	-0.075	0.048	-0.060	-0.084	-0.065	0.051	0.022	0.063	0.049	*-0.087*	-0.024

Table 5.2 (continued)

Variable		W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG
W	*SQSUBS*	1.000										
X	*FORGN*	**0.346**	1.000									
Y	*LNASSET*	**0.141**	**0.119**	1.000								
Z	*FORGNSALE*	**0.298**	**0.713**	**0.137**	1.000							
AA	*RECINV*	0.012	-0.037	**-0.260**	-0.060	1.000						
AB	*ACQ*	0.071	**0.112**	**0.162**	*0.078*	0.028	1.000					
AC	*NWFUND*	0.064	*0.093*	**0.103**	0.058	-0.004	*0.083*	1.000				
AD	*NWFUNDRATIO*	-0.013	0.044	-0.063	*0.080*	-0.069	-0.003	*0.085*	1.000			
AE	*NEWDIR*	0.032	-0.010	*0.077*	-0.001	-0.026	0.043	0.039	0.034	1.000		
AF	*RESTR*	**0.194**	**0.152**	**0.150**	**0.135**	-0.011	-0.005	*0.083*	0.022	0.059	1.000	
AG	*ROA*	0.028	**0.112**	**-0.211**	*0.095*	-0.12	-0.050	-0.061	**0.102**	-0.004	**-0.101**	1.000

LNAFEE= the natural log of audit fees; *LNNAF*=natural log of NAS fees; *LNTOTALFEES*=natural log of the sum of audit and NAS fees; *FEERATIO1*= the fee ratio of NAS fees to total fees; *FEERATIO2*= the fee ratio of NAS fees to audit fees; *SPECLST_MS*= continuous variable which equals to the respective auditor' market share; *SPECLST_PS*= continuous variable which equals to the respective auditor' portfolio share; *SPECLST_WEIGHTED*= continuous variable which equals to the compliment between auditor' market share (*SPECLST_MS*) and portfolio share *(SPECLST_PS); SPECLST_MSLEADER*= coded as 1 if the auditor earned the largest market share in each particular industry, 0 if otherwise; *SPECLST_PSTOP3*= coded as 1 if the incumbent auditor earned the highest top three portfolio shares and 0 if otherwise, and *SPECLST_MS30*= coded as 1 if the auditor' market share exceed 30 percent in each particular industry, 0 if otherwise ; *BRDSIZE*=the numbers of board' members during the year; *BDRNED*=the proportion of non-executive directors on board to board size; *BRDEXP*=the proportion of directors with accounting experience and financial qualification to board size; *BRDMEET*= the number of board meetings during the year; *ACSIZE*= the number of audit committee members; *ACIND*= coded as 1 if audit committee had solely non-executive directors; 0 otherwise; *ACEXP*= the proportion of audit committee members with accounting experience and financial qualification to audit committee size; *ACMEET*= the number of audit committee meetings during the year; *INOWN*=the cumulative percentage of total shares owned by the directors of a firm; *BLOCK*= the cumulative percentage shares ownership of the blockholders who hold at least 5 percent or more of outstanding common shares and who are unaffiiliated with management; *LEVERG*=the proportion of debts to total assets; *RETURN*= the fiscal year total stock return; *SQSUBS*= the square root of total consolidated subsidiaries; *FORGN*=the proportion of foreign subsidiaries to total consolidated subsidiaries; *LNASSET*= the natural logarithm of total assets; *FORGNSALE*= proportion of the firm' foreign sales; *RECINV*= the proportion of total assets in account receivable and inventory; *ACQ*= the number of acquisitions made by the company during the year; *NWFUND* = coded as 1 if the firm issued new shares or debt for cash during the year, 0 otherwise; *NWFUNDRATIO*= proceed from new debt and equity issuances/ total assets; *NEWDIR*=coded as 1 if the firm appoint new external director during the year, 0 otherwise; *RESTR*= coded as 1 if the restructuring program has occurred during the year; *ROA*= return on assets. Correlation in bold are significant at p<0.01, in italic are significant at p<0.05 and underline at p<0.10.

5.4 ANALYSIS I: AUDIT FEES

5.4.1 Multivariate regression

Table 5.3 presents the results for the audit fees model for each year and for the pooled sample. The F-statistics for all models are significant at $p<0.01$, suggesting that the models are statistically valid. The adjusted R^2 for all models ranges between 77.2% and 79.5%, showing that the models have a higher explanatory power and this is consistent with prior studies on audit fees (Simunic, 1980; Abbott et al., 2003a).

As expected the *BRDNED* is significant and positively related to audit fees across all models, suggesting the firms with a higher proportion of independent non-executive directors on board are likely to have higher audit fees. This result confirms the results from Carcello et al. (2002) and Abbot et al. (2003a) who argued that independent non-executive directors on boards demand an additional and extensive audit effort in order to certify their monitoring function, thus increasing the audit fees and the perceived audit quality, primarily for the purpose of safeguarding their interests. Compared to the previous UK studies by O'Sullivan (2000) and Adelopo (2010), the primary evidence suggests that in terms of 'independent' characteristics, it seems to be insensitive in differentiating the types of non-executive director.[52] This result is consistent with prior UK studies.

The other hypotheses variables such as *BRDSIZE, BRDEXP, BRDMEET, ACSIZE, ACIND, ACEXP* and *ACMEET* are either marginally significant in the opposite predictions or insignificant with audit fees in year-by-year or pooled samples. *BRDSIZE* is insignificant with audit fees in all models. However, in the year 2008 and in the pooled sample, the results contradict those of Carcello et al. (2002). *BRDMEET* and *BRDEXP* are significantly and negatively related to audit fees, suggesting that boards of directors that are equipped with financial expertise and that have a higher frequency of board meetings are associated with lower audit fees. These results may be influenced by the supply-based perspective (Tsui et al., 2001; Krishnan and Visvanathan, 2009). There is a possibility that auditors value the financial expertise

[52] In O'Sullivan (2000), he defines the proportion of non-executive directors as the percentage of outsider members, while in Adelopo (2010) the independent non-executive directors are defined as those directors with no business or contractual relationships with the firms. Both studies suggest a positive relationship between non-executive directors and audit fees. In this thesis the 'independent' characteristic is assigned on the basis of the criteria outlined in the UK Corporate Governance Code (2010).

and the active involvement of board members, and perceive these characteristics to be associated with a more effective monitoring function of the board, consequently reduce their risk assessment, audit effort and fees accordingly.

ACSIZE is significant and positively related to audit fees in the year 2005 at p<0.10(t=1.78). This weak relationship is also shown in other models and suggests that there is no evidence that it is linked with audit fees. The other audit committee characteristics (*ACIND, ACMEET,* and *ACEXP)* are insignificant with audit fees in all models. The insignificant findings on these variables contradict the findings of Abbott et al. (2003a) but are relatively similar to Carcello et al. (2002). The mixed findings may be due variation in the nature of the sample selections. Abbott et al. (2003) examine an overall sample of firms that filed their statements with SEC, which contains both smaller and larger firms. On the other hand, Carcello et al. (2002) examine a sample of *Fortune 1000* firms which basically contains larger firms than are found in the sample population examined by Abbott et al. (2003a). The nature of the sample examined by Carcello et al (2002) was similar to that which has been analysed in this study. Thus, it is reasonable to expect similar findings to Carcello et al. (2002).

The results for all the control variables are significant in the predicted directions except for *RECINV*, which is insignificant with audit fees across all models. There is a significant positive relationship between audit fees and the complexity of a firms' operations *(SQSUBS* and *FORGN)* at p<0.01. As predicted, the firms with a higher number of consolidated subsidiaries and foreign subsidiaries are likely to have higher audit fees since the auditors need to put more audit effort and audit hours into dealing with complex operations, thus increasing the audit fees. These results are consistent with Simunic (1980), Craswell and Francis (1999), Abbott et al. (2003a) and Carcello et al. (2002).

LEVERG is positive and significantly related to audit fees at p<0.01, suggesting that auditors perceive that the firms with higher leverage are associated with a higher litigation risk, which may lead to more frequent audit failures, due to their poor financial condition. Thus, an auditor may increase their audit effort and fees for these firms (i.e. higher leverage firms) in order to compensate their litigation risk. This result is consistent with the findings of prior studies (Simunic and Stein, 1996; Menon and Williams, 2001, Pratt and Stice, 1994).

The firm size *(LNASSET)* is positive and significant with audit fees at $p<0.01$. This may suggest that as a firm's size increases, auditors enlarge the audit scope and extend the audit hours, which in turn results in higher audit fees. This result is consistent with the results from Simunic (1980), Abbott et al. (2003a) and Carcello et al. (2002).

In summary, the result from the multivariate regression is consistent with the proposition of agency theory, which suggests that independent non-executive directors on boards are associated with effective monitoring. They complement their monitoring function by demanding a higher quality audit from an external auditor in terms of a more extensive audit effort and a higher number of audit hours, resulting in higher audit fees and a higher perceived audit quality. The other corporate governance variables seem to provide inconsistent results or suggest insignificant relationships with audit fees across the samples by year and within the pooled sample. In particular, the effect of the monitoring role of an independent board outweighs the other effective characteristics of a board and audit committee. Therefore, there is no consistent evidence that board size, the financial expertise and meeting frequency of boards, and all audit committee characteristics (e.g. size, composition of independent members, financial expertise and meeting frequency) are associated with increased audit fees. The results of all the control variables are significant in the predicted directions and consistent with the prior studies, except for *RECINV*, which suggest that it has no relationship to audit fees.

Table 5.3: The result of multivariate regression for audit fees model

$LNAFEE = \alpha_0 + \beta_1 BRDSIZE + \beta_2 BRDNED + \beta_3 BRDEXP + \beta_4 BRDMEET + \beta_5 ACSIZE + \beta_6 ACIND + \beta_7 ACEXP + \beta_8 ACMEET + \beta_9 SQSUBS + \beta_{10} FORGN + \beta_{11} RECINV + \beta_{12} LEVERG + \beta_{13} LNASSET + \varepsilon$

Variables	Coefficient *(t-statistics)*				
	2005 (*N*=167)	2006 (*N*=181)	2007 (*N*=181)	2008 (*N*=145)	Pooled (*N*=674)
Intercept	-1.152 *(-5.10)****	-0.894 *(-3.92)****	-0.807 *(-3.72)****	-0.629 *(-2.60)****	-0.882 *(-8.04)****
BRDSIZE	0.001 *(0.07)*	0.008 *(0.73)*	0.015 *(1.43)*	-0.101 *(-1.00)*	0.004 *(0.72)*
BRDNED	0.526 *(2.62)****	0.421 *(1.97)***	0.419 *(2.16)***	0.443 *(2.10)***	0.445 *(4.52)****
BRDEXP	-0.110 *(-0.68)*	-0.174 *(-1.04)*	-0.130 *(-0.91)*	-0.285 *(-1.70)**	-0.163 *(-2.08)***
BRDMEET	-0.002 *(-0.33)*	-0.007 *(-1.06)*	-0.003 *(-0.48)*	-0.014 *(-1.77)**	-0.007 *(-1.95)**
ACSIZE	0.046 *(1.78)**	0.040 *(1.44)*	0.0180 *(0.78)*	-0.010 *(-0.41)*	0.019 *(1.72)*
ACIND	-0.037 *(-0.87)*	-0.052 *(-1.13)*	0.031 *(0.77)*	-0.019 *(-0.40)*	-0.014 *(-0.65)*
ACEXP	0.092 *(0.84)*	0.062 *(0.53)*	-0.027 *(-0.31)*	0.034 *(0.29)*	0.025 *(0.51)*
ACMEET	0.004 *(0.32)*	0.024 *(1.53)*	0.005 *(0.32)*	0.004 *(0.20)*	0.010 *(1.39)*
SQSUBS	0.038 *(4.27)****	0.038 *(4.45)****	0.035 *(4.13)****	0.048 *(4.94)****	0.038 *(9.02)****
FORGN	0.468 *(8.75)****	0.448 *(7.99)****	0.463 *(8.21)****	0.393 *(6.72)****	0.449 *(16.58)****
RECINV	0.104 *(0.233)*	0.076 *(0.91)*	0.031 *(0.37)*	-0.143 *(-1.62)*	0.025 (0.60)
LEVERG	0.401 *(5.00)****	0.382 *(5.50)****	0.314 *(4.09)****	0.376 *(3.87)****	0.382 *(9.81)****
LNASSET	0.481 *(12.45)****	0.447 *(10.30)****	0.447 *(11.46)****	0.495 *(11.70)****	0.470 *(23.94)****
Adj. R^2	0.783	0.772	0.780	0.795	0.789

*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10.

5.4.3 The additional analyses and robustness tests

This section further investigates the results obtained in the primary analysis. The purpose of additional analyses is to provide reasonable assurance that the main findings are robust to the specifications of various models.[53]

5.4.3.1 Heteroscedasticity and muticollinearity checks

To confirm whether or not heteroscedasticity exists, the present study uses the Breush-Pagan or Cook-Weisberg test. If the p-value is significant, then the null hypothesis, that the variance of the residuals is constant, would be rejected, suggesting the presence of heteroscedasticity. As can be seen from Table 5.4, the p-value is insignificant at $p<0.10$. Therefore, the null hypothesis has to be accepted, indicating no presence of heteroscedasticity.[54]

The Pearson correlation matrix in the previous section (Table 5.2) shows that several variables have largest correlations. *LNASSETS* has higher correlation with *LNAFEE*, *BRDSIZE* and *BRDNED*, while *BRDEXP* has higher correlation with *ACEXP*. These higher correlations with total assets may be harmful and thus degrade the influences of audit fees, board size and proportion of independent board members. The higher correlations between *BRDEXP* and *ACEXP* are expected since audit committee expertise is a part of board of directors' expertise. In order to further investigate whether these larger correlations may indicate the problem of muticollinearity, the present study calculates the variance inflation factor (VIF) and tolerance value. The results are presented in Table 5.5. If the variables have VIF values greater than 10 or tolerance values lower than 0.10, then they are considered to have multicollinearity problems (Gujarati, 2003: 339). Since all the variables have VIF values that are approximately 1.09 to 2.10 and tolerance values that are higher than 0.10 this suggests that no multicollinearity problem exists.

[53] The additional analyses and the robustness tests are been performed on the pooled sample and analysed using the OLS regression, unless stated otherwise.

[54] Besides the Breush-Pagan test, White test is also been performed and the result relatively similar that suggest no indication of heteroskedasticity.

5.4.3.2 Different regression estimators

This section provides alternative regression estimators such as robust regression (iteratively reweighted least squares), least square with clustered robust regression and quantile regressions.[55]The robust regression (iteratively reweighted least squares) and the least square with clustered robust regression provide better estimations when the sample contains mild outliers and does not adequately fulfil the OLS assumptions (Hamilton, 1999; Chen et al., 2003; Adkins and Hill, 2007; Gujarati, 2003), while quantile regression disregards all the OLS assumptions (Gujarati, 2003). The results are presented in Table 5.6. As can be seen, the results of these estimators are consistent with the main finding. There is not much difference between the results of OLS regression and the other alternative estimators. *BRDNED* is positively and significantly related to audit fees at $p<0.01$. *BRDEXP* and *BRDMEET* are also found to be significantly and negatively related to audit fees across all regression estimators, including the OLS regression. Similarly, *ACSIZE* is significantly and positively related to audit fees. All the control variables are significantly correlated in predicted directions except that there is no significant correlation between *RECINV* and audit fees. This is relatively consistent with the results reported in the primary findings. Overall, these results may suggest that the main findings reported in Table 5.6 are robust to various estimators and to the violation of OLS assumptions

5.4.3.3Client size effects

The main findings suggest significant results for *BRDNED.* There is a possibility that this result is driven by client size. Thus, several tests are performed to examine the influence of firm size on *BRDNED*. Following the example of Carcello et al. (2002), the present study split the pooled sample into two subsets of data at the median of *LNASSET* (proxy for firm size). The first data set is comprised of the firms that have a *LNASSET* below the median and this group is identified as the "small firms". The second data set is comprised of the firms that have a *LNASSET* above the median and this group is identified as the "large firms". The regressions are re-run separately on

[55] Using the *Stata* program, the command of *rreg* was used to perform the robust regression. For the least square with clustered robust regression, the cluster is based on the industry supersector code. The cluster option helps to deal with the independent assumption that the errors associated with one observation are not correlated with errors of other observation. In the current situation, for example, the firms within each industry supersector will tend to be more like those in the same supersector than the firms from different industry supersectors from which their errors are not independent.

these two subsets of firms. The results are presented in Table 5.7. Consistent with the primary finding, *BRDNED* is positive and significant for "small" and "large" firms. However, the result of *BRDEXP* does not hold in the sample of "large firms". *ACSIZE* is insignificant with audit fees in either of the samples. The results of control variables in both subsets of firms are relatively similar to those that are reported in the primary findings. In addition to these, the *ACEXP* and *ACMEET* are found to be significantly and positively related to audit fees in the "small" firms but not in the "large" firms.

The Chow test is also performed to test the differences in the regression coefficient between the "small" and "large" subsets. As can be seen from the Table 5.8, the F-statistic values of board and audit committee variables are insignificant except for *ACEXP*, thus the null hypothesis that the regression coefficients of board and audit committee variables in both subsets are equal cannot be rejected, suggesting that the regression coefficients of board and audit committee variables in the "small" and "large" firms are essentially similar and consistent (except for *ACEXP).*

In summary, the *BRNED* appeared to be reasonably consistent across both subsets, suggesting the significant result on *BRNED* is not influenced by the client size.

5.4.3.4 New definitions for board and audit committee variables

The primary results suggest that most of the audit committee variables are insignificant with audit fees, except for *ACSIZE*. Following Abbott et al. (2003a), the present study provides new definitions for audit committee variables to see whether alternative definitions affect the main results. The new definitions are as follows:

(1) *ACIND* is now in the continuous version, defined as the proportion of independent non-executive director on audit committee *(ACIND1)*.

(2) *ACEXP* is defined as a dichotomous variable, *ACEXP1*, and coded as 1 if audit committee had at least one director equipped with financial expertise, and 0 if otherwise.

(3) *ACMEET* is also defined as a dichotomous variable, *ACMEET1*, coded as 1 if an audit committee meeting frequency is more than the sample median, and 0 if otherwise.

Besides the new definitions of audit committee variables, the present study also provides alternative specifications for board of director variables. Instead of continuous versions, *BRDNED* is now defined as a dummy variable, coded as 1 if 60% of the firm's directors are independent, and 0 if otherwise. This variable is known as *BRDNED1*. Similarly, *BRDSIZE* is also now defined as a dummy variable; *BRDSIZE1* is coded as 1 if the firm's board size is less than sample median, and 0 if otherwise. These specifications are cited from DeFond et al. (2005). The other variable's descriptions remain unchanged. The results are presented in Table 5.9. None of the audit committee variables were significant except *ACSIZE*, which has a positive relationship with audit fees in the year 2005, and this is consistent with the primary findings. The result of *BRDNED* remains significant in every year and in the pooled regressions, while *BRDEXP* and *BRDMEET* are significantly and negatively related to audit fees in the pooled model only. The control variables remained quantitatively significant across all models. In summary, the primary findings are robust to the alternative definitions of board and audit committee variables.

5.4.3.5 <u>Additional control variables</u>

In addition to the control variables included in the main model, there are several variables that are argued to influence the determinants of audit fees. These variables are return on assets *(ROA)*, liquidity ratio *(LIQ)*, and growth *(GROWTH)*. The present study tested whether the inclusion of these variables would affect the primary results. All of these variables are sourced from *Datastream*. Following Whisenant et al. (2003) and Lee and Mande (2005), *LIQ* is defined as the ratio of current assets divided by current liabilities, while *GROWTH* represents the growth rate in sales over the previous fiscal year. In line with Whisenant et al. (2003), *ROA* and *LIQ* are proxies for risk sharing factors, and thus positive relationships are expected between these variables and audit fees. *GROWTH* is a proxy for the client size and the larger the firms are expected to have higher the audit fees due to the increased scope of audits and audit testing (Whisenant et al., 2003; Lee and Mande, 2005). Hence, *GROWTH* is expected to be positively related to audit fees. The results are presented in Table 5.10. *BRDNED* is significant in all year-by-year and pooled regressions. *BRDMEET* and *BRDEXP* are found to be negatively and significantly related to audit fees in the year 2008 and in the pooled models. *ACINSIZE* is positive and only significant in the year 2005 model. The results for all control variables are significant in the predicted directions in all models except for *RECINV*, *ROA* and *LIQ*, which are insignificantly related to audit fees across all models. *GROWTH* is positive and significantly related to audit fees in the year 2006 and in the pooled models. In general, the main findings reported in Table 5.6 hold, even with the inclusion of these additional control variables.

5.4.3.6 Endogeneity and two-stage least squares (2SLS) regression

Prior literature suggests that there is a significant relationship between auditing services and NAS when both are jointly provided by the same auditor (Simunic, 1984; Palmrose, 1986b). There are two sets of arguments that NAS fees may affect audit fees or *vice versa*. The first argument relates to knowledge spillovers that are thought to reduce the fixed or marginal costs of audits or NAS. Such decreases in the marginal cost of audits or NAS may then affect the level of audit fees or NAS fees, depending on the price elasticity of the demand function for audits or NAS (Siminuc, 1984). This suggests that there will be a positive relationship between audit and NAS fees. The second argument is that there is a possibility that auditing services may be used as a "loss-leader" in order to gain a higher profit margin on NAS fees (Hillson and Kennelley, 1988: 33). In other words, the auditor discounts auditing services in order to hold on to the lucrative fees of NAS, which in turn suggests that there will be a negative relationship between audit and NAS fees. Evidences from prior literature also suggest that board of director and audit committee characteristics may influence an auditors' risk assessment and audit planning, which in turn affects the audit pricing (Tsui et al., 2001; Boo and Sharma, 2008; Krishnan and Visvanathan, 2009). To address these issues, the present study first identifies whether the NAS fees or board of director and audit committee characteristics may suffer from the endogeneity problem by performing the Durbin-Wu-Hausman test on each of these variables. Following Larcker and Rusticus (2010) the instrumental variables (IV) are the lagged values of the endogenous variables.[56] The Durbin-Wu-Hausman tests the null hypothesis that the residual values of *LNNAF*, *BRDSIZE*, *BDRNED*, *BRDMEET*,

[56] The IV must fulfill the following conditions: (1) outside the regression model, (2) uncorrelated with regression errors and (3) strongly correlated with endogenous variables. To ensure the IV is valid the present study estimated the reduced form equations on the first stage of 2SLS regression and examined the significance level of the endogenous variables. The *t*-statistic should be at least 3.3 (Adkins and Hill, 2007: 249-250). All the IVs meet the suggested criterions.

BRDEXP, *ACSIZE*, *ACIND*, *ACMEET* and *ACEXP* are jointly equal to zero.[57] If the F-statistic is significant, then the null hypothesis would be rejected, suggesting that endogeneity is present. Table 5.11 present the results of the Durbin-Wu-Hausman test. Most of the variables suggest insignificant F-statistics except for *LNNAF, BDRNED, BRDEXP* and *ACSIZE*, which confirm the presence of endogeneity since the F-statistic is significant.

To mitigate the bias caused by endogeneity, the 2SLS regression is performed on *LNNAF, BDRNED, BRDEXP* and *ACSIZE*. The results are presented in Table 5.12. Compared with the main finding, the results of 2SLS regressions are relatively consistent, except for the *ACSIZE*, which is found to be positively related to *LNAFE* in most of the 2SLS models. *LNNAF* is significant and positively related to *LNAFEE*, suggesting that the firms with higher audit fees are likely to have higher NAS fees. The other variables remained unchanged. In summary, the main finding on *BRDNED* is that it continues to have positive relationship with *LNAFEE*, suggesting that the inference made regarding *BRDNED* in the main finding is robust to the presence of endogeneity.

[57] Since the *ACIND* is a dummy variable, it is changed to a continuous version, *ACIND1*, which is defined as the proportion of independent non-executive directors on an audit committee

Table 5.4: Heteroscedasticity test for audit fees model
Breusch-Pagan or Cook-Weisberg Test
H_0 = The variance of the residuals is constant Reject H_0 if p-value is significant
chi2(1) = 0.25 Prob > chi2 = 0.6167

Table 5.5: VIF and tolerance value for audit fees model		
Variables	VIF	Tolerance
BRDSIZE	2.10	0.477
BRDNEXP	2.00	0.500
BRDNED	1.91	0.524
LNASSET	1.90	0.527
ACEXP	1.71	0.586
ACSIZE	1.60	0.625
ACIND	1.36	0.732
FORGN	1.28	0.780
ACMEET	1.27	0.786
SQSUBS	1.21	0.825
BRDMEET	1.18	0.844
RECINV	1.09	0.916
LEVERG	1.09	0.917
Mean VIF	1.52	

Table 5.6: The results of different estimators for audit fees model (*N*=674)			
Variables	Coefficient *(t-statistics)*		
	Robust regression	Least square regression with clustered robust	Quantile regression
Intercept	-0.881 *(-7.75)****	-0.883 *(-5.45)****	-0.888 *(-8.80)****
BRDSIZE	0.003 *(0.60)*	0.004 *(0.41)*	-0.003 *(-0.60)*
BRDNED	0.449 *(4.40)****	0.446 *(3.14)****	0.307 *(3.39)****
BRDEXP	-0.201 *(-2.42)***	-0.171 *(-1.40)**	-0.350 *(-4.70)***
BRDMEET	-0.006 *(-1.73)**	-0.007 *(-3.14)***	-0.009 *(-2.94)***
ACSIZE	0.017 *(1.56)**	0.020 *(1.77)**	0.016 *(1.74)**
ACIND	-0.015 *(-0.70)*	-0.014 *(-0.68)*	-0.006 *(-0.33)*
ACEXP	0.047 *(0.84)*	0.035 *(0.52)*	0.082 *(0.73)*
ACMEET	0.007 *(0.96)*	0.011 *(1.73)*	0.005 *(0.73)*
SQSUBS	0.039 *(8.72)****	0.039 *(8.38)****	0.036 *(9.33)****
FORGN	0.465 *(16.56)****	0.449 *(9.28)****	0.495 *(19.79)****
RECINV	0.004 *(0.10)*	0.025 *(0.15)*	-0.031 *(-0.80)*
LEVERG	0.385 *(9.54)****	0.381 *(7.12)****	0.406 *(11.26)****
LNASSET	0.473 *(23.25)****	0.470 *(12.51)****	0.504 *(27.99)****
Adj. R^2/ Pseudo R^2	0.780	0.789	0.552
*** are significant at *p*<0.01, ** are significant at *p*<0.05 and *at *p*<0.10.			

Table 5.7: The results of the multivariate regression of audit fees model for "small" and "large" firms.		
Variables	Coefficient *(t-statistics)*	
	"Small firms" (*N*=337)	"Large firms" (*N*=337)
Intercept	-0.712 *(-3.04)******	-0.596 *(-2.43)******
BRDSIZE	0.003 *(0.45)*	0.010 *(1.19)*
BRDNED	0.402 *(3.01)******	0.526 *(3.59)******
BRDEXP	-0.239 *(-2.38)****	-0.065 *(-0.49)*
BRDMEET	-0.003 *(-0.64)*	-0.008 *(-1.56)*
ACSIZE	0.009 *(0.42)*	0.015 *(0.95)*
ACIND	-0.0203 *(-0.70)*	-0.008 *(-0.26)*
ACEXP	0.116 *(1.65)*	-0.067 *(-0.81)*
ACMEET	0.018 *(1.76)*	0.005 *(0.49)*
SQSUBS	0.049 *(8.49)******	0.030 *(4.68)******
FORGN	0.368 *(10.14)******	0.519 *(12.21)******
RECINV	0.014 *(-0.27)*	0.049 *(0.73)*
LEVERG	0.353 *(7.64)******	0.398 *(5.41)******
LNASSET	0.441 *(10.51)******	0.418 *(10.00)******
Adj. R^2	0.647	0.708
*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10.		

Table 5.8: Chow Test		
H_0 = The regression coefficient on the small and large subsets are essentially the same Reject H_0 if p-value is significant		
	F (1, 646)	Prob > F
BRDSIZE	0.55	0.460
BRDNED	0.49	0.485
BRDEXP	1.25	0.264
BRDMEET	0.68	0.409
ACSIZE	0.05	0.817
ACIND	0.09	0.768
ACEXP	3.75	0.053
ACMEET	0.75	0.386

Table 5.9: The results of audit fees model for the alternative test variable definitions

Variables	Coefficient *(t-statistics)*				
	2005 (*N*=167)	2006 (*N*=181)	2007 (*N*=181)	2008 (*N*=145)	Pooled (*N*=674)
Intercept	-1.021 *(-4.15)******	-0.919 *(-4.01)******	-0.660 *(-2.50)****	-0.690 *(-2.84)******	-0.836 *(-6.98)******
BRDSIZE1	0.022 *(0.56)*	-0.002 *(-0.05)*	-0.036 *(-0.94)*	0.024 *(0.55)*	0.000 *(0.00)*
BRDNED1	0.083 *(2.05)****	0.068 *(1.75)**	0.088 *(2.35)****	0.088 *(2.00)****	0.083 *(4.46)******
BRDEXP	-0.010 *(-0.08)*	-0.172 *(-1.41)*	-0.152 *(-1.45)*	-0.194 *(-1.23)*	-0.132 *(-2.26)****
BRDMEET	-0.002 *(-0.28)*	-0.007 *(-1.20)*	-0.002 *(-0.27)*	-0.012 *(-1.60)*	-0.005 *(-1.74)**
ACSIZE	0.052 *(1.72)**	0.038 *(1.66)*	0.023 *(1.08)*	-0.012 *(-0.49)*	0.024 *(1.11)*
ACIND1	-0.012 *(-0.13)*	0.022 *(0.22)*	0.009 *(0.48)*	-0.019 *(-0.17)*	0.013 *(0.66)*
ACEXP1	-0.032 *(-0.45)*	0.079 *(0.90)*	0.005 *(0.07)*	-0.011 *(-0.18)*	0.008 *(0.23)*
ACMEET1	0.018 *(0.47)*	0.013 *(0.30)*	0.017 *(0.39)*	-0.010 *(-0.23)*	0.013 *(0.62)*
SQSUBS	0.040 *(5.05)******	0.035 *(4.43)******	0.035 *(3.95)******	0.044 *(4.96)******	0.038 *(9.04)******
FORGN	0.473 *(8.40)******	0.479 *(8.69)******	0.471 *(8.36)******	0.411 *(6.57)******	0.461 *(16.68)******
RECINV	0.089 *(0.91)*	0.047 *(0.56)*	0.038 *(0.43)*	-0.112 *(-1.15)*	0.022 (0.51)
LEVERG	0.373 *(4.80)******	0.381 *(6.56)******	0.337 *(4.44)******	0.381 *(4.52)******	0.371 *(10.70)******
LNASSET	0.494 *(12.93)******	0.488 *(13.56)******	0.467 *(13.30)******	0.511 *(15.64)******	0.491 *(27.99)******
Adj. R^2	0.795	0.783	0.793	0.810	0.792

*** are significant at *p*<0.01, ** are significant at *p*<0.05 and *at *p*<0.10.

Table 5.10: The results of audit fees model with the additional control variables					
Variables	Coefficient *(t-statistics)*				
	2005 (*N*=167)	2006 (*N*=181)	2007 (*N*=181)	2008 (*N*=145)	Pooled (*N*=674)
Intercept	-1.061 *(-4.91)****	-0.770 *(-3.65)****	-0.855 *(-3.88)***	-0.663 *(-3.03)***	-0.872 *(-8.44)****
BRDSIZE	0.002 *(0.19)*	0.006 *(0.68)*	0.012 *(1.33)*	-0.012 *(-1.11)*	0.003 *(0.60)*
BRDNED	0.523 *(2.64)****	0.407 *(2.09)***	0.348 *(1.91)**	0.507 *(2.44)***	0.427 *(4.59)****
BRDEXP	-0.107 *(-0.64)*	-0.239 *(-1.39)*	-0.146 *(-1.22)*	-0.242 *(-1.67)**	-0.163 *(-2.26)***
BRDMEET	-0.002 *(-0.29)*	-0.008 *(-1.46)*	-0.003 *(-0.42)*	-0.014 *(-1.91)**	-0.007 *(-2.09)***
ACSIZE	0.049 *(2.17)***	0.035 *(1.44)*	0.023 *(1.11)*	0.010 *(1.33)*	0.019 *(1.52)*
ACIND	-0.042 *(-1.05)*	-0.063 *(-1.47)*	0.039 *(0.93)*	-0.030 *(-0.61)*	-0.011 *(-0.56)*
ACEXP	0.103 *(0.91)*	0.089 *(0.74)*	-0.015 *(-0.22)*	0.013 *(0.11)*	0.033 *(0.70)*
ACMEET	0.006 *(0.47)*	0.028 *(1.24)*	0.005 *(0.32)*	0.007 *(0.38)*	0.011 *(1.49)*
SQSUBS	0.038 *(4.98)****	0.041 *(5.36)****	0.034 *(4.00)****	0.046 *(5.32)****	0.039 *(9.14)****
FORGN	0.467 *(8.28)****	0.461 *(8.26)****	0.467 *(8.40)****	0.373 *(5.39)****	0.451 *(16.01)****
RECINV	0.090 *(0.90)*	0.070 *(0.80)*	0.046 *(0.49)*	-0.116 (-1.20)	0.013 (0.28)
LEVERG	0.381 *(4.65)****	0.371 *(5.97)****	0.354 *(4.53)****	0.376 *(4.43)****	0.374 *(10.49)****
LNASSET	0.467 *(11.00)****	0.441 *(11.63)****	0.457 *(11.89)****	0.495 *(13.88)****	0.472 *(24.79)****
ROA	-0.001 *(-0.64)*	-0.002 *(1.02)*	0.002 *(1.02)*	0.001 *(0.53)*	0.001 *(0.80)*
LIQ	0.095 *(1.65)*	-0.997 *(-1.43)*	0.000 *(0.01)*	0.111 *(1.38)*	0.034 *(1.13)*
GROWTH	0.000 *(0.11)*	0.001 *(1.78)**	0.001 *(1.08)*	-0.000 *(-0.03)*	0.001 *(1.98)***
Adj. R^2	0.804	0.795	0.799	0.817	0.795
** are significant at *p*<0.05 and *at *p*<0.10.					

Table 5.11: Endogeneity test for audit fees model	
Durbin-Wu-Hausman Test	
H_0 = the residual of *LNNAF*, *BRDSIZE*, *BDRNED*, *BRDMEET*, *BRDEXP*, *ACSIZE*, *ACIND*, *ACMEET* and *ACEXP* are exogenous Reject H_0 if F-statistic significant	
Variable	Chi2 (1)
LNNAF	27.432 (p=0.000)
BRDSIZE	1.476 (p=0.224)
BRDNED	7.469 (p=0.006)
BRDEXP	4.157 (p=0.041)
BRDMEET	2.398 (p=0.121)
ACSIZE	6.521 (p=0.010)
ACIND	0.101 (p=0.749)
ACEXP	0.688 (p=0.406)
ACMEET	0.367 (p=0.544)

Table 5.12: The results of 2SLS regression for audit fees model (*N*=674)				
Variables	Coefficient *(t-statistics)*			
	LNNAF	*BRDNED*	*BRDEXP*	*ACSIZE*
Intercept	-0.750 *(-6.42)******	-0.788 *(-7.66)******	-0.792 *(-7.63)******	-0.865 *(-8.57)******
LNNAF	0.242 *(6.42)******	0.072 *(3.98)******	0.076 *(4.27)******	0.078 *(4.43)*
BRDSIZE	-0.003 *(-0.55)*	0.006 *(1.37)*	-0.002 *(-0.38)*	-0.003 *(-0.66)*
BRDNED	0.235 *(2.20)*****	0.661 *(4.77)******	0.378 *(4.09)******	0.294 *(3.03)******
BRDEXP	-0.131 *(-1.64)*	-0.152 *(-2.12)*****	-0.292 *(-2.94)******	-0.170 *(-2.37)*****
BRDMEET	-0.003 *(-0.85)*	-0.006 *(-1.84)****	-0.006 *(-1.80)****	-0.006 *(-1.74)****
ACSIZE	0.033 *(2.73)******	0.012 *(0.99)*	0.025 *(2.37)*****	0.054 *(3.37)******
ACIND	-0.014 *(-0.57)*	-0.042 *(-1.79)****	-0.012 *(-0.59)*	-0.006 *(-0.30)*
ACEXP	0.031 *(0.59)*	0.023 *(0.49)*	0.081 *(1.47)*	0.054 *(1.14)*
ACMEET	-0.003 *(-0.40)*	0.003 *(0.46)*	0.008 *(1.07)*	0.007 *(1.06)*
SQSUBS	0.029 *(6.41)******	0.037 *(8.91)******	0.037 *(9.04)******	0.035 *(8.74)******
FORGN	0.381 *(12.27)******	0.414 *(15.04)******	0.429 *(15.84)******	0.429 *(15.83)******
RECINV	0.078 *(1.52)*	0.042 *(0.93)*	0.041 *(0.91)*	0.041 (0.90)
LEVERG	0.329 *(9.01)******	0.361 *(10.14)******	0.368 *(10.71)******	0.366 *(10.59)******
LNASSET	0.377 *(13.88)******	0.420 *(20.21)******	0.440 *(21.68)******	0.437 *(21.51)******
Adj. R^2	0.754	0.801	0.803	0.802
** are significant at *p*<0.05 and *at *p*<0.10.				

5.5 ANALYSIS II: NAS FEES

5.5.1 Multivariate regression

Table 5.13 presents the results of the NAS fees model by year and in the pooled samples. All models are estimated using the OLS regression, except for *FEERATIO2*, which is regressed using the least square regression with robust standard error, because the evidence suggests that the *FEERATIO2* model is heteroscedastic. The result of the heteroscedastic test is provided in the additional analyses and robustness tests section.

FEERATIO1 and *FEERATIO2* are regressed only on the pooled model since year-by-year models lack of significant F-statistics. The adjusted R^2 for *LNNAF* and *LNTOTALFEES* models' are between 23.5% and 63.8% relatively. The adjusted R^2 for *LNTOTALFEES* is relatively similar to that reported in Ashbaugh et al. (2003). Compared to *LNTOTALFEES*, the adjusted R^2 for the *LNNAF* model is relatively lower and this is partially due to the 18 firms that report zero NAS fees.[58] The adjusted R^2 for *FEERATIO1* is 2.2% and *FEERATIO2* is 7.5%, which is relatively lower than that documented in Abbott et al.'s (2003b) study, which reports that the adjusted R^2 for F*EERATIO2* is in between 9.3% and 17.4%.[59]

In general, the regression results of the *LNNAF* model are consistent with the *LNTOTALFEES* model, while the results of *FEERATIO1* are relatively similar to *FEERATIO2*. *BRDSIZE* has positive correlation coefficients with all auditor independence measurements. It is significantly related to *LNNAF* (in the year 2005 and in the pooled models) and to *LNTOTALFEES* (in the years 2005 and 2006 and in the pooled model) but it is insignificant with *FEERATIO1* and *FEERATIO2*. The positive relationship may suggest that the firms with smaller board size are more likely to limit NAS purchased as they believe that the higher level of NAS may compromise auditor independence. The significant results are relatively consistent with the previous audit quality study documented in Abbott et al (2004), which

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[58] The results of multivariate regressions for *LNNAF*, *FEERATIO1* and *FEERATIO2* are relatively similar when we include or exclude the sample firms that report zero NAS fees.

[59] Abbott et al. (2003b: 229) show the regression results based on a full sample and two subsamples.

concluded that a smaller board is more effective in controlling the incidence of restatement.

Contrary to the expectation, *BRDNED* is found to be positively and significantly related to *LNNAF* and *LNTOTALFEES* in most years and in the pooled models. However it is insignificant with *FEERATIO1* and *FEERATIO*2. Ashbaugh et al. (2003) and Larcker and Richardson (2004) suggest that *LNNAF* and *LNTOTALFEES* are better measurements than NAS ratios for capturing the economic importance of the client to the auditor. The positive relationship of *BRDNE*D and *LNNAF* to *LNTOTALFEES* may imply that independent boards view the joint provision of audit and NAS as not necessarily compromising audit independence but possibly broadening the auditors' knowledge and improving their judgments, resulting in a higher audit quality (see Simunic, 1984; Beck et al., 1988a; Arruñada, 1999a; 1999b; 2000; Wallman, 1996; Goldman and Barlev, 1974).

BRDEXPR is insignificant with all the auditor independence measures. Previously, Lee (2008) documents *BRDEXP* as composite index is positively related to the changes in *FEERATIO2.* Specifically, the composite index is measured as a dichotomous variable, coded as 1 if more than half NAS committee board members are independent and at least 27.27% (sample median) of them are financial expertise, and 0 if otherwise. Lee's study, however, does not report the result for *BRDNED* and *BRDEXP* as single variable. *BRDMEET* is negative and significant only with *LNTOTALFEES* (in the year 2008 and in the pooled models), but no statistical evidence is found to associate it with other measures.

ACSIZE is negatively related to *LNNAF* (in the year 2008), *FEERATIO1* and *FEERATIO2* (both in the pooled model), but there is no evidence that it is associated with *LNTOTALFEES*. *ACIND* is significantly and negatively related to *LNTOTALFEES* in the year 2006 but is insignificant with other measures. Previous studies report A*CIND* to be negatively and significantly related to *FEERATIO2* as separate variables (Abbott et al., 2003b) and as composite index variables (Abbott et al., 2003b; Lee and Mande, 2005 and Lee, 2008).[60] Likewise, the result indicates no significant association between *ACEXP* and all other auditor independence measures; this is consistent with the findings of Abbott et al (2003b). However Lee (2008) reports *ACEXPR* to be significantly related to *LNNAF* when it is modelled as a composite index variable.

The present study finds that *ACMEET* is positive and significant across all auditor independence measures in the year 2008 and in the pooled models except for the *FEERATIO2* measure. These results suggest that the firms with an active audit committee are likely to have higher NAS fees, higher total fees and a higher ratio of NAS fees to total fees. It may be perceived that, where higher levels of NAS are purchased, an auditor's knowledge is broadened thus improving the overall audit quality. As prior studies have acknowledged, possible benefits flow from the joint provision of audit and NAS (Simunic, 1984; Beck et al., 1988a; Arruñada, 1999a; 1999b; 2000; Wallman, 1996; Goldman and Barlev, 1974). Previous studies report *ACMEET* to be negatively and significantly related to *FEERATIO2* and *LNNAF* when it is defined as a composite index (Abbott et al., 2003b; Lee and Mande, 2005), but provide no such evidence when it is modelled as a separate variable (Abbott et al., 2003b).

In general, the coefficients of the control variables are relatively significant and stable across the all measures of auditor independence. The coefficient of *INOWN* is positive but only significant in the case of *LNNAF* and *FEERATIO*1 (in the pooled models), whereas the coefficient of *BLOCK* is also positive but significant only in relation to *FEERATIO1* and *FEERATIO2.* These results are consistent with the findings of Firth (1997) but contradictory to Abbott et al (2003b) who find negative coefficients for these two variables. *LEVERG* is significantly and positively related to *LNTOTALFEES* in the years 2005 and 2006, and in the pooled models, but no evidence of significant relationships are found in the other models. The present study finds that there is no significant relationship between *RETURN* and all other measures

[60] Abbott et al. (2003b) and Lee and Mande (2005) define audit committee effectiveness as a dummy variable, coded as 1 if the audit committee is solely independent and meets at least four times a year. Lee (2008) defines audit committee effectiveness as a dummy variable as well by taking into consideration the audit committee's expertise variable, coded as 1 if audit committee is solely independent and at least one-third of them are financial experts.

of auditor independence and this is consistent with the findings of Abbott et al. (2003b). *LNASSET* is significantly and positively related to *LNNAF* and *LNTOTALFEES* in the year-by-year and pooled models but there is no evidence to indicate an association with *FEERATIO1* and *FEERATIO2*.

ACQ is positive and significantly related to *LNNAF* and *LNTOTALFEES* but only in the selected year. *NWFUND* is conditional to the measures of auditor independence, it is found to be positively related to *LNTOTALFEES* (in the year 2007) but negatively related to *FEERATIO1* and *FEERATIO2* in the pooled models. *NEWDIR* is significantly and positively related to *FEERATIO*1 and *FEERATIO2* but no evidence associates it with *LNNAF* and *LNTOTALFEES*. *RESTR* is found to be positively and significantly related to *LNNAF*, *LNTOTALFEES* and *FEERATIO* in most years and in the pooled regressions. In general, most of the events that are associated with the demand for the purchase of NAS are in the predicted directions, in agreement with Firth (1997), except for *NWFUND*, which has a negative relationship to *FEERATIO1* and *FEERATIO2* that may suggest that the firms with new shares issued or debt for cash do not necessarily require professional advice from the auditors

Overall, the multivariate regression finds consistent evidence that the independent board is positively correlated with the purchase of NAS. Rather than holding the view that higher levels of NAS impair auditor independence, independent non-executive directors on boards seem to support the view that a higher NAS provision improves an auditor's judgment and audit quality due to the knowledge spillover effect. The other hypothesis variables provide inconsistent support for the view that they are linked with NAS fees. Among the control variables, *LNASSET* is found to be significantly and positively related with NAS fees across both the year-by-year and the pooled samples.

Table 5.13: The results of multivariate regression for NAS fees model

$$FEE = \alpha_0 + \beta_1 BRDSIZE + \beta_2 BRDNED + \beta_3 BRDEXP + \beta_4 BRDMEET + \beta_5 ACSIZE + \beta_6 ACIND + \beta_7 ACEXP + \beta_8 ACMEET + \beta_9 INOWN + \beta_{10} BLOCK + \beta_{11} LEVERG + \beta_{12} RETURN + \beta_{13} LNASSET + \beta_{14} ACQ + \beta_{15} NWFUND + \beta_{16} NEWDIR + \beta_{17} RESTR + \varepsilon$$

The dependent variable of ***FEE*** is measured as follows:
(1) *LNNAF*; (2) *LNTOTALFEES*; (3) *FEERATIO1*; (4) *FEERATIO2*

Variable	Coefficient (t-statistics)											
	2005 (N=167)		2006 (N=181)		2007 (N=181)		2008 (N=145)		Pooled (N=674)			
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(3)	(4)
Intercept	-1.682 (-2.27)**	-0.644 (-1.79)*	-0.580 (-0.87)	-0.116 (-0.38)	-0.780 (-1.04)	-0.432 (-1.33)	-0.863 (-1.16)	-0.211 (-0.60)	-0.776 (-2.24)**	-0.336 (-2.10)**	0.348 (3.18)***	1.091 (1.33)
BRDSIZE	0.069 (2.03)**	0.028 (1.67)*	0.022 (0.74)	0.026 (1.91)*	0.020 (0.62)	0.019 (1.41)	0.048 (1.54)	0.022 (1.50)	0.036 (2.37)**	0.024 (3.37)***	0.002 (0.39)	0.010 (0.28)
BRDNED	0.973 (1.54)	0.866 (2.82)***	1.214 (1.96)*	0.764 (2.70)***	1.260 (2.06)**	0.741 (2.81)***	0.790 (1.33)	0.748 (2.66)***	0.982 (3.32)***	0.754 (5.54)***	0.034 (0.37)	0.289 (0.46)
BRDEXP	0.505 (1.00)	0.137 (0.56)	-0.441 (-0.91)	-0.185 (-0.84)	-0.193 (-0.43)	-0.132 (-0.69)	0.435 (0.85)	0.145 (0.60)	0.001 (0.00)	-0.026 (-0.24)	-0.023 (-0.30)	-0.315 (-0.71)
BRDMEET	0.001 (0.04)	-0.007 (-0.62)	-0.012 (-0.62)	-0.007 (-0.85)	-0.006 (-0.25)	-0.013 (-1.33)	-0.029 (-1.36)	-0.020 (-1.97)*	-0.015 (-1.45)	-0.011 (-2.34)**	0.004 (1.24)	0.042 (1.60)
ACSIZE	-0.037 (-0.45)	0.013 (0.31)	-0.027 (-0.33)	0.035 (0.93)	-0.045 (-0.62)	0.019 (0.60)	-0.118 (-1.67)*	-0.050 (-1.49)	-0.055 (-1.49)	0.004 (0.25)	-0.024 (-2.06)**	-0.143 (-1.93)*
ACIND	-0.094 (-0.71)	-0.016 (-0.25)	-0.095 (-0.73)	-0.109 (-0.183)*	0.001 (0.01)	-0.030 (-0.54)	0.212 (1.57)	0.041 (0.64)	-0.003 (-0.05)	-0.031 (-1.05)	-0.007 (-0.36)	-0.081 (-0.55)
ACEXP	0.021 (0.06)	0.066 (0.39)	-0.044 (-0.13)	0.017 (0.11)	-0.077 (-0.28)	-0.008 (-0.07)	-0.239 (-0.72)	-0.097 (-0.62)	-0.056 (-0.37)	0.010 (0.14)	0.001 (0.01)	0.204 (0.58)
ACMEET	0.032 (0.69)	0.033 (1.48)	0.049 (1.07)	0.034 (1.63)	0.043 (0.89)	0.032 (1.54)	0.113 (2.06)**	0.066 (2.52)**	0.065 (2.88)***	0.041 (3.88)***	0.013 (1.84)*	0.089 (1.35)
INOWN	0.005 (1.06)	0.003 (1.20)	0.004 (0.87)	-0.001 (-0.29)	0.003 (0.86)	0.002 (1.40)	0.006 (0.97)	0.000 (0.15)	0.004 (1.77)*	0.001 (1.21)	0.001 (1.91)*	0.015 (1.63)
BLOCK	0.001 (0.18)	0.002 (1.02)	0.003 (0.90)	0.002 (1.14)	0.005 (1.46)	0.001 (0.73)	-0.001 (-0.22)	-0.000 (-0.09)	0.002 (1.00)	0.001 (1.51)	0.001 (1.95)*	0.010 (2.54)**

Table 5.13 (continued)

Variable	Coefficient *(t-statistics)*											
	2005 (*N*=167)		2006 (*N*=181)		2007 (*N*=181)		2008 (*N*=145)		Pooled (*N*=674)			
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(3)	(4)
LEVERG	0.227 *(0.90)*	0.334 *(2.74)****	0.322 *(1.55)*	0.320 *(3.38)****	-0.019 *(-0.07)*	0.119 *(1.06)*	0.050 *(0.18)*	0.198 *(1.52)*	0.176 *(1.51)*	0.255 *(4.74)****	-0.039 *(-1.07)*	-0.126 *(-0.57)*
RETURN	0.001 *(0.32)*	-0.000 *(-0.22)*	0.003 *(0.83)*	0.000 *(0.15)*	0.001 *(0.23)*	0.000 *(0.15)*	-0.001 *(-0.23)*	0.000 *(0.56)*	0.001 *(0.66)*	-0.000 *(-0.09)*	0.000 *(0.20)*	-0.003 *(-1.27)*
LNASSET	0.402 *(3.32)****	0.418 *(7.13)****	0.389 *(3.06)****	0.382 *(6.58)****	0.419 *(3.27)****	0.434 *(7.84)****	0.465 *(3.65)****	0.462 *(7.69)****	0.400 *(6.60)****	0.425 *(15.19)****	0.013 *(0.67)*	-0.026 *(-0.20)*
ACQ	0.012 *(0.40)*	0.019 *(1.34)*	0.062 *(2.41)***	0.044 *(3.73)****	-0.003 *(-0.13)*	0.023 *(2.07)***	-0.014 *(-0.54)*	0.010 *(0.86)*	0.015 *(1.18)*	0.025 *(4.23)****	-0.004 *(-0.87)*	-0.014 *(-0.75)*
NWFUND	0.441 *(2.20)***	0.075 *(0.77)*	-0.269 *(-1.51)*	-0.096 *(-1.18)*	0.162 *(0.78)*	0.265 *(2.972)****	-0.226 *(-1.15)*	-0.124 *(-1.33)*	0.029 *(0.31)*	0.014 *(0.33)*	-0.058 *(-1.99)***	-0.510 *(-1.68)**
NEWDIR	0.007 *(0.06)*	0.023 *(0.44)*	0.129 *(1.24)*	-0.001 *(-0.01)*	-0.084 *(-0.79)*	0.028 *(0.61)*	0.048 *(0.45)*	-0.075 *(-1.51)*	0.029 *(0.59)*	-0.003 *(-0.15)*	0.028 *(1.79)**	0.174 *(1.73)**
RESTR	0.237 *(2.10)***	0.142 *(2.60)***	0.421 *(4.24)****	0.221 *(4.87)****	0.069 *(0.63)*	0.070 *(1.48)*	0.052 *(0.51)*	0.082 *(1.69)**	0.188 *(3.70)****	0.123 *(5.25)****	0.031 *(1.90)**	0.111 *(1.16)*
Adj. R^2	0.235	0.559	0.311	0.638	0.147	0.598	0.317	0.653	0.260	0.614	0.022	0.075

*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10. All models are been estimated using the OLS regression except for *FEERATIO2* which been regressed using the least square regression with robust standard error because the evidence suggest that the *FEERATIO2* model is heterscedastic.

5.5.3 The additional analyses and robustness tests

In this section the present study examines whether the primary findings hold in the case of the violation of OLS assumptions, and whether they are robust in various other model specifications. The tests include heteroscedasticity and multicollinearity checks, different regression estimators, client size analysis, alternative definitions of hypotheses variables, additional control variables, and an endogeneity test and 2SLS regression.

5.5.3.1 Heteroscedasticity and muticollinearity checks

Table 5.14 presents the results of the heteroscedasticity test according to the specific dependent variables. Based on the Breusch-Pagan or Cook-Weisberg test, most models indicate an insignificant *p*-value, suggesting that the variances of the residuals are homogeneous, except for *FEERATIO2*, which has a significant p-value at $p<0.01$, which indicates the present of heteroscedasticity.[61]

The results of VIF test and tolerance value are presented in Table 5.15.[62] None of the variables had a VIF value of more than 10 or a tolerance value lower than 0.10, suggesting no indication of a multicollinearity problem.

5.5.3.2 Different regression estimators

This section provides the results of multivariate regression using different estimators. Previously, *LNNAF, LNTOTALFEES* and *FEERATIO1* were regressed using the OLS estimator, while *FEERATIO2* was regressed using the least square regression with robust standard errors. In this section, *LNNAF, LNTOTALFEES* and *FEERATIO1* will be regressed using robust regression and quantile regression, while *FEERATIO2* will be regressed using the OLS and GLS regressions. The results are presented in Table 5.16.

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[61] The White test also revealed a similar result. There was no indication of heteroscedasticity in any of the auditor independence measurements except for the *FEERATIO2* model.

[62] This result is based on the modelling of *LNNAF* as a dependent variable. The other models indicate relatively similar VIF and tolerance values.

The robust regression is efficient when the models contain mild outliers and do not fulfil the normality assumption (Hamilton, 1999; Chen et al., 2003; Adkins and Hill, 2007; Gujarati, 2003). The quantile regression is one of the non-parametric tests which do not require any assumptions (Gujarati, 2003). The GLS regression is an alternative to the least square regression with robust standard error that is efficient in controlling heteroscedastic models.

As can be seen, the results of robust and quantile regressions are relatively consistent with the OLS regression presented in the main findings (Table 5.6) except for the relationship between *LNNAF* and *INOWN* and the relationship between *FEERATIO1* and *BLOCK*. Both of these relationships are insignificant in the quantile regression. The hypothesis variables remain unchanged.[63]

For the *FEERATIO2* model, GLS regression provides consistent results with the least square regression with robust standard error, as shown in the main findings (Table 5.6). This may be due to the efficiency of both estimators in controlling error variances so that each sample observation would have a constant variance. However, the results of OLS regression were slightly different. The main findings and those of the GLS regression (pooled sample) suggest that *ACMEET* and *INOWN* are insignificantly related with *FEERATIO2* but, under OLS regression, both are found to be positively and significantly related to *FEERATIO2* at $p<0.10$ and $p<0.01$ respectively. The results for the other variables are relatively consistent with the main findings. The inconsistency of the results, for variables *ACMEET* and *INOWN* under the OLS regression, may be partly due to the presence of the heteroscedasticity problem identified in the *FEERATIO2* model. The statisticians suggests that in the presence of heteroscedasticity, the least square estimator with robust standard error (Huber-White standard errors) or GLS regression are much more efficient than the OLS estimator because they able to reweight the error variances and thus correct for heteroscedasticity and autocorrelation (Adkins and Hill, 2007: 196; Gujarati, 2003: 387). In other words, in the presence of heteroscedasticity, the results of OLS regression may be distorted and biased.

[63] They might be different in terms of levels of significance but this does not change the content of the main findings.

5.5.3.3 Client size effects

The present study re-regress the NAS fees model to see whether the results of *BRDNED* are driven by client size. Following the approach of Carcello et al. (2002), the pooled samples are split into two groups at the median of *LNASSET*. Firms with *LNASSET* below median are grouped together as the "small" firms and those with *LNASSET* above median are grouped together as the "large" firms. The regressions are re-run separately using the OLS estimator.[64] The results are presented in Table 5.17. Consistent with the primary findings (pooled model), *BRDNED* is significantly and positively related to *LNNAF* and *LNTOTALFEES* for both "small" and "large" firms. The other hypotheses variables and the control variables are either significant in "small" or "large" firms or significant/insignificant in both groups, depending on the auditor independence measures. In summary, *BRDNED* is the only hypotheses variable that is found to be consistent across "large" and "small" firms and thus it confirms the main finding that the independent boards is not driven by client size.

5.4.3.4 New definitions for board and audit committee variables

As with the audit fees model, the present study tests whether alternative specifications for hypotheses variables affect the main analysis. Following to approaches of Abbott et al. (2003a) and DeFond et al. (2005), the alternative definitions for board and audit committee variables *(BRDSIZE*, *BRDNED*, *ACIND*, *ACEXP*, *ACMEET)* are as follows:

(1) *BRDSIZE1* is coded as 1 if the firm's board size is less than sample median, and 0 if otherwise.

(2) *BRDNED1* is coded as 1 coded as 1 if 60% of the firm's directors are independent, and 0 if otherwise.

(3) *ACIND1* is defines as the proportion of independent non-executive director on the audit committee.

(2) *ACEXP1* is coded as 1 if audit committee had at least one director equipped with financial expertise, and 0 if otherwise.

(3) *ACMEET1* is coded as 1 if audit committee meeting frequency is more than the sample median, and 0 if otherwise.

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[64] The *FEERATIO2* model revealed an insignificant F-statistic (regressed using the least square regression with robust standard error), suggesting that the model is statistically invalid. Thus, the results are not reported.

The definitions of the other variables remain unchanged. Table 5.18 presents the results for the new definitions.[65] As can be seen, the results for the alternative definitions are relatively consistent with the main findings, except for *BRDSIZE1* and *ACEXP1*. *BRDSIZE1* is found to be negatively related to NAS fees measurements, suggesting the firms with a board size that is smaller than the sample median are likely to have higher NAS fees. This may indicate that the firms with fewer board members are likely to have more NAS. The results for the NAS fees variables seem to be sensitive to the alternative definition of board size. *BRDNED1* and *ACMEET1* are positively related to NAS fees, suggesting that the firms with boards that have more than 60% independent membership, and whose audit committee meetings are more frequent than the sample median, are likely to have higher NAS fees. *ACEXP1* is negatively related to all auditor independence measurements. This suggesting that the audit committees with at least one member equipped with financial expertise are more likely to limit the level of NAS purchased as they have the perception that higher NAS impairs auditor independence. The results from the control variables are relatively unchanged. Overall, the primary findings on the independence of boards are not modified by alternative definitions for independent non-executive directors.

5.4.3.5 Additional control variables

Several control variables are included in the primary model to see whether the inclusion of these variables affect the results. As with the audit fees model, these variables are: return on assets *(ROA)*, liquidity ratio *(LIQ)*, and growth *(GROWTH)*. These are predicted to be positively related to NAS fees. Prior literature suggests that more profitable firms and higher growth firms are likely to have more resources to purchase NAS (Habib and Islam, 2007; Antle et al., 2006). The results are presented in Table 5.19. The results for the hypotheses variables and the main control variables are relatively similar to the main findings. *ROA* is positively related to *LNTOTALFEES* at p<0.10, but insignificantly related with other measures. *GROWTH* is found to be positively related to *FEERATIO1* and *FEERATIO2*. These results are relatively consistent with the findings of Habib and Islam (2007) who suggest that firms with a higher profitability and higher growth are likely to purchase more NAS.

[65] All the models are regressed using the OLS except for *FEERATIO2* model, which is estimated using the least square regression with robust standard error.

Overall, the main finding is unchanged and the additional control variables are unlikely to affect the results

5.4.3.6 Endogeneity and two-stage least squares (2SLS) regression

As previously highlighted in the section of additional analysis and robustness tests for the audit fees model, evidence from prior studies suggests that there are two possible outcomes of the joint provision of audit and NAS. The first possibility is related to the knowledge spillover effect that suggests that there will be a positive relationship between audit fees and NAS fees. . The second possibility is that higher NAS fees are used to discount auditing services in order to gain a higher profit margin on the lucrative NAS fees. This leads to a negative relationship between audit and NAS fees. Both arguments lead to the issue of endogeneity. In addition, prior literature also suggests that board of director and audit committee characteristics are likely to be associated with endogeneity (e.g. Larcker and Richardson, 2004; Larcker and Rusticus, 2010). Therefore, to investigate these concerns, the present study first examined whether these variables suffer from endogeneity by performing the Durbin-Wu-Hausman test.[66] Table 5.11 presents the results of the Durbin-Wu-Hausman test for each variable analysed under *LNNAF, LNTOTALFEES, FEERATIO1* and *FEERATIO2* models. As can be seen, the F-statistics are insignificant in all models suggesting no indication of endogeneity. This may not required the 2SLS test. As suggested by Baum et al. (2003), in the absence of endogeneity, the results of 2SLS regressions are unacceptable and biased. In summary, the results estimated using the least square regression with robust standard error in the main analysis is more efficient due to the absence of endogeneity.

[66] As with the audit fees model, *ACIND* is changed to a continuous version of the variable and is called *ACIND1* (defined as the proportion of independent non-executive directors on the audit committee) in order to perform the Durbin-Wu-Hausman test.

Table 5.14: Heteroscedasticity test for NAS fees model		
Breusch-Pagan or Cook-Weisberg Test		
H_0 = The variance of the residuals is constant Reject H_0 if p-value is significant		
Dependent variable	chi2(1)	Prob > chi2
LNNAF	0.27	0.606
LNTOTALFEES	0.47	0.492
FEERATIO1	1.62	0.203
FEERATIO2	417.92	0.000

Table 5.15: VIF and tolerance values for NAS fees model		
Variables	VIF	Tolerance
BRDSIZE	2.11	0.474
LNASSET	2.02	0.495
BRDNED	2.01	0.498
BRDEXP	1.89	0.531
ACEXP	1.73	0.579
ACSIZE	1.65	0.605
ACIND	1.37	0.730
ACMEET	1.30	0.771
BRDMEET	1.19	0.843
INOWN	1.12	0.890
BLOCK	1.11	0.898
ACQ	1.09	0.915
LEVERG	1.09	0.916
RESTR	1.07	0.932
NWFUND	1.07	0.937
RETURN	1.06	0.940
NEWDIR	1.06	0.943
Mean VIF	1.41	
*** are significant at $p<0.01$, ** are significant at $p<0.05$ and *at $p<0.10$.		

Table 5.16: The results of different estimators for NAS fees model (*N*=674)								
Variable	Coefficient *(t-statistics)*							
	Robust regression			Quantile regression			OLS regression	GLS regression
	LNNAF	*LNTOTALFEES*	*FEERATIO1*	*LNNAF*	*LNTOTALFEES*	*FEERATIO1*	*FEERATIO2*	*FEERATIO2*
Intercept	-0.855 *(-3.57)****	-0.348 *(-2.17)***	0.326 *(2.82)****	-0.756 *(-3.49)****	-0.235 *(-1.22)*	0.293 *(2.43)***	1.091 *(1.55)*	1.06 *(1.26)*
BRDSIZE	0.025 *(2.33)***	0.024 *(3.44)****	0.002 *(0.34)*	0.022 *(2.27)***	0.021 *(2.46)***	0.003 *(0.57)*	0.010 *(0.31)*	0.007 *(0.21)*
BRDNED	0.693 *(3.40)****	0.733 *(5.35)****	0.020 *(0.20)*	0.709 *(3.84)****	0.751 *(4.56)****	0.037 *(0.36)*	0.289 *(0.48)*	0.318 *(0.50)*
BRDEXP	-0.086 *(-0.53)*	-0.033 *(-0.31)*	-0.015 *(-0.19)*	-0.042 *(-0.29)*	-0.132 *(-1.02)*	-0.017 *(-0.22)*	-0.315 *(-0.66)*	-0.306 *(-0.69)*
BRDMEET	-0.006 *(-0.92)*	-0.010 *(-2.08)***	0.004 *(1.14)*	-0.018 *(-1.38)*	-0.012 *(-2.06)***	0.003 *(0.80)*	0.042 *(1.05)*	0.044 *(1.59)*
ACSIZE	0.000 *(0.01)*	0.007 *(0.40)*	-0.023 *(-1.90)**	0.012 *(0.53)*	0.027 *(1.29)*	-0.026 *(-1.98)***	-0.143 *(-1.89)**	-0.151 *(-1.99)***
ACIND	-0.022 *(-0.50)*	-0.033 *(-1.11)*	-0.005 *(-0.22)*	-0.019 *(-0.48)*	-0.055 *(-1.58)*	-0.018 *(-0.80)*	-0.081 *(-0.63)*	-0.097 *(-0.64)*
ACEXP	0.002 *(0.02)*	-0.013 *(-0.18)*	-0.001 *(-0.03)*	0.013 *(0.14)*	0.046 *(0.55)*	-0.037 *(-0.75)*	0.204 *(0.66)*	0.197 *(0.54)*
ACMEET	0.06 *(3.85)****	0.039 *(3.75)****	0.014 *(1.82)**	0.035 *(2.51)***	0.031 *(2.51)***	0.012 *(1.67)**	0.089 *(1.93)**	0.091 *(1.29)*
INOWN	0.003 *(1.73)**	0.001 *(0.22)*	0.001 *(1.65)**	0.000 *(1.15)*	0.000 *(0.09)*	0.001 *(1.64)**	0.015 *(3.44)****	0.015 *(1.59)*
BLOCK	0.002 *(1.02)*	0.001 *(1.51)*	0.001 *(1.79)**	0.001 *(0.66)*	0.001 *(1.22)*	0.001 *(1.45)*	0.010 *(1.45)****	0.010 *(2.43)***
LEVERG	0.164 *(1.43)*	0.266 *(4.91)****	-0.043 *(-1.10)*	0.162 *(1.41)*	0.265 *(4.10)****	-0.045 *(-1.11)*	-0.126 *(-0.53)*	-0.103 *(-0.46)*
Table 5.16 (continued)								

Variable	Coefficient *(t-statistics)*							
	Robust regression			Quantile regression			OLS regression	GLS regression
	LNNAF	*LNTOTALFEES*	*FEERATIO1*	*LNNAF*	*LNTOTALFEES*	*FEERATIO1*	*FEERATIO2*	*FEERATIO2*
RETURN	-0.000 *(-0.27)*	-0.000 *(-0.08)*	0.000 *(0.30)*	0.000 *(0.20)*	0.000 *(0.14)*	0.000 *(0.44)*	-0.003 *(-0.99)*	-0.003 *(-1.28)*
LNASSET	0.445 *(10.64)****	0.4259 *(15.28)****	0.018 *(0.87)*	0.455 *(12.085)****	0.411 *(12.20)****	0.026 *(1.21)*	-0.026 *(-0.21)*	-0.015 *(-0.11)*
ACQ	0.021 *(2.39)***	0.025 *(4.13)****	-0.003 *(-0.73)*	0.032 *(4.03)****	0.031 *(4.32)****	0.001 *(0.30)*	-0.014 *(-0.53)*	-0.014 *(-0.72)*
ISSUE	-0.088 *(-1.36)*	0.000 *(0.01)*	-0.068 *(-2.16)***	0.075 *(1.32)*	0.012 *(0.23)*	-0.077 *(-2.38)***	-0.510 *(-2.69)****	-0.536 *(-1.72)**
NEWDIR	0.035 *(1.02)*	0.002 *(0.07)*	0.028 *(1.78)**	-0.010 *(-0.33)*	0.025 *(0.90)*	0.029 *(1.67)**	0.174 *(1.72)**	0.179 *(1.75)**
REST	0.131 *(3.72)****	0.121 *(5.12)****	0.029 *(1.83)**	0.115 *(3.58)***	0.113 *(3.99)****	0.040 *(2.25)***	0.111 *(1.07)***	0.113 *(1.15)*
Adj. R^2/ Pseudo R^2	0.295	0.618	0.018	0.418	0.409	0.024	0.051	0.052
*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10.								

Table 5.17: The results of NAS fees model for "small" and "large" firms (*N*=337)						
Variables	Coefficient *(t-statistics)*					
	LNNAF		*LNTOTALFEES*		*FEERATIO1*	
	"Small"	"Large"	"Small"	"Large"	"Small"	"Large"
Intercept	-0.010 *(-0.01)*	-1.013 *(-1.28)*	-0.015 *(-0.04)*	-0.392 *(-1.14)*	0.595 *(2.31)***	0.216 *(0.96)*
BRDSIZE	0.42 *(2.03)***	0.031 *(1.24)*	0.028 *(2.82)****	0.023 *(2.08)***	0.000 *(0.06)*	0.007 *(0.92)*
BRDNED	1.337 *(3.30)****	0.755 *(1.66)**	0.819 *(4.14)****	0.733 *(3.73)****	0.148 *(1.05)*	-0.021 *(-0.16)*
BRDEXP	0.019 *(0.06)*	0.020 *(0.05)*	-0.236 *(-1.56)*	0.246 *(1.49)*	0.016 *(0.15)*	-0.059 *(-0.55)*
BRDMEET	0.001 *(0.07)*	-0.029 *(-1.82)**	-0.001 *(-0.19)*	-0.021 *(-3.11)****	0.005 *(1.11)*	0.004 *(0.77)*
ACSIZE	-0.149 *(-2.25)***	-0.029 *(-0.59)*	-0.052 *(-1.67)**	0.017 *(0.83)*	-0.059 *(-2.57)***	-0.011 *(-0.79)*
ACIND	-0.149 *(-1.70)**	0.097 *(1.02)*	-0.041 *(-0.961)****	-0.041 *(-0.99)*	-0.056 *(-1.84)**	0.031 *(1.14)*
ACEXP	-0.011 *(-0.05)*	-0.076 *(-0.34)*	0.108 *(1.03)*	-0.087 *(-0.90)*	-0.016 *(-0.22)*	0.038 *(0.59)*
ACMEET	0.039 *(1.25)*	0.087 *(2.53)***	0.041 *(2.68)****	0.040 *(2.65)****	0.001 *(0.10)*	0.024 *(2.47)***
INOWN	0.001 *(0.43)*	0.007 *(1.91)**	-0.000 *(-0.34)*	0.003 *(1.96)**	0.000 *(0.47)*	0.002 *(1.81)**
BLOCK	0.002 *(0.93)*	0.001 *(0.48)*	0.001 *(1.01)*	0.001 *(1.18)*	0.001 *(0.96)*	0.001 *(1.95)**
LEVERG	0.145 *(1.03)*	0.164 *(0.74)*	0.194 *(2.82)****	0.296 *(3.05)****	-0.042 *(-0.85)*	-0.049 *(-0.76)*
RETURN	0.001 *(0.58)*	0.001 *(0.63)*	0.000 *(0.18)*	0.000 *(0.32)*	0.000 *(0.22)*	0.000 *(0.34)*
LNASSET	0.312 *(2.40)***	0.418 *(3.20)****	0.398 *(6.29)****	0.421 *(7.44)****	0.005 *(0.10)*	-0.001 *(-0.04)*
ACQ	0.025 *(1.06)*	0.013 *(0.79)*	0.032 *(2.78)****	0.023 *(3.27)****	0.001 *(0.11)*	-0.005 *(-1.08)*
NWFUND	-0.064 *(-0.57)*	0.160 *(0.96)*	-0.028 *(-0.51)*	0.066 *(0.91)*	-0.119 *(-3.09)****	0.037 *(0.79)*
NEWDIR	0.029 *(0.43)*	0.028 *(0.37)*	-0.023 *(-0.73)*	0.021 *(0.64)*	0.032 *(1.39)*	0.018 *(0.84)*
REST	0.162 *(2.30)***	0.218 *(2.82)****	0.116 *(3.39)****	0.142 *(4.24)****	0.045 *(1.85)**	0.011 *(0.50)*
Adj. R^2	0.080	0.190	0.309	0.504	0.027	0.027
*** are significant at *p*<0.01, ** are significant at *p*<0.05 and *at *p*<0.10.						

Table 5.18: The results of NAS fees model for the alternative test variable definitions (*N*=674)				
Variables	Coefficient *(t-statistics)*			
	LNNAF	*LNTOTALFEES*	*FEERATIO1*	*FEERATIO2*
Intercept	-0.407 *(-1.01)*	-0.043 *(-0.23)*	0.448 *(3.69)****	1.604 *(1.87)**
BRDSIZE1	-0.080 *(-1.70)**	-0.064 *(-2.30)***	0.026 *(1.41)*	-0.208 *(-1.69)**
BRDNED1	0.121 *(2.11)***	0.115 *(4.31)****	-0.011 *(-0.63)*	-0.165 *(-1.41)*
BRDEXP	0.073 *(0.37)*	0.059 *(0.65)*	0.049 *(0.83)*	0.250 *(0.64)*
BRDMEET	-0.012 *(-1.21)*	-0.009 *(-1.92)**	0.005 *(1.47)*	0.047 *(1.95)**
ACSIZE	-0.023 *(-0.66)*	0.021 *(1.27)*	-0.022 *(-2.20)***	-0.139 *(-2.22)***
ACIND1	0.016 *(0.18)*	-0.025 *(-0.58)*	0.002 *(0.11)*	-0.011 *(-0.09)*
ACEXP1	-0.184 *(-1.77)**	-0.100 *(-2.06)***	-0.093 *(-2.81)****	-0.386 *(-2.11)***
ACMEET1	0.152 *(2.44)***	0.079 *(2.71)****	0.025 *(1.79)**	0.222 *(1.39)*
INOWN	0.003 *(1.43)*	0.001 *(0.82)*	0.001 *(1.35)*	0.013 *(1.49)*
BLOCK	0.002 *(1.38)*	0.001 *(1.98)**	0.001 *(2.31)***	0.011 *(2.77)****
LEVERG	0.197 *(1.67)**	0.256 *(4.66)****	-0.030 *(-0.86)*	-0.075 *(-0.33)*
RETURN	0.001 *(0.63)*	-0.000 *(-0.03)*	0.000 *(0.14)*	-0.003 *(-1.19)*
LNASSET	0.493 *(8.92)****	0.486 *(18.84)****	0.020 *(1.22)*	0.032 *(0.30)*
ACQ	0.018 *(1.40)*	0.026 *(4.23)****	-0.003 *(-0.79)*	-0.010 *(-0.50)*
NWFUND	-0.004 *(-0.05)*	-0.008 *(-0.18)*	-0.072 *(-2.09)***	-0.613 *(-2.03)***
NEWDIR	0.038 *(0.76)*	0.004 *(0.16)*	0.028 *(1.79)**	0.177 *(1.77)**
REST	0.198 *(3.85)****	0.130 *(5.43)****	0.032 *(2.00)***	0.118 *(1.22)*
Adj. R^2	0.244	0.598	0.034	0.062
*** are significant at *p*<0.01, ** are significant at *p*<0.05 and *at *p*<0.10.				

Table 5.19: The results of NAS fees model with the additional control variables (*N*=674)				
Variables	Coefficient *(t-statistics)*			
	LNNAF	*LNTOTALFEES*	*FEERATIO1*	*FEERATIO2*
Intercept	0.923 *(-2.55)***	-0.434 *(-2.61)****	0.357 *(3.14)****	1.211 *(1.43)*
BRDSIZE	0.036 *(2.32)***	0.023 *(3.26)****	0.003 *(0.59)*	0.017 *(0.50)*
BRDNED	0.958 *(3.22)****	0.754 *(5.50)****	0.050 *(0.53)*	0.445 *(0.69)*
BRDEXP	0.001 *(0.00)*	-0.028 *(-0.26)*	-0.020 *(-0.27)*	-0.313 *(-0.72)*
BRDMEET	-0.014 *(-1.37)*	-0.010 *(-2.21)***	0.004 *(1.25)*	0.043 *(1.64)*
ACSIZE	-0.055 *(-1.47)*	0.005 *(0.30)*	-0.025 *(-2.10)***	-0.147 *(-1.98)***
ACIND	0.002 *(0.04)*	-0.027 *(-0.94)*	-0.009 *(-0.44)*	-0.096 *(-0.65)*
ACEXP	-0.067 *(-0.44)*	0.000 *(0.01)*	-0.009 *(-0.19)*	0.142 *(0.42)*
ACMEET	0.061 *(2.67)****	0.037 *(3.54)****	0.012 *(1.70)**	0.082 *(1.27)*
INOWN	0.004 *(1.69)**	0.001 *(1.06)*	0.001 *(1.67)**	0.013 *(1.49)*
BLOCK	0.002 *(0.99)*	0.001 *(1.56)*	0.001 *(1.84)**	0.010 *(2.44)***
LEVERG	0.193 *(1.64)*	0.267 *(4.95)****	-0.0033 *(-0.89)*	-0.076 *(-0.35)*
RETURN	0.001 *(0.71)*	0.000 *(0.09)*	0.000 *(0.26)*	-0.003 *(-1.16)*
LNASSET	0.418 *(6.74)****	0.436 *(15.26)****	0.010 *(0.51)*	-0.056 *(-0.42)*
ACQ	0.015 *(1.19)*	0.024 *(4.06)****	-0.004 *(-0.96)*	-0.018 *(-0.95)*
NWFUND	0.032 *(0.34)*	0.012 *(0.27)*	-0.062 *(-2.10)***	-0.547 *(-1.82)**
NEWDIR	0.028 *(0.55)*	-0.003 *(-0.15)*	0.027 *(1.72)**	0.167 *(1.65)**
REST	0.194 *(3.80)****	0.127 *(5.40)****	0.030 *(1.86)**	0.104 *(1.09)*
ROA	0.004 *(1.35)*	0.002 *(1.85)**	-0.001 *(-0.74)*	-0.007 *(-1.22)*
LIQ	-0.046 *(-0.48)*	0.019 *(0.42)*	-0.027 *(-0.88)*	-0.154 *(-0.80)*
GROWTH	0.001 *(0.45)*	0.001 *(1.00)*	0.001 *(1.99)***	0.006 *(2.07)***
Adj. R^2	0.260	0.616	0.024	0.058
*** are significant at *p*<0.01, ** are significant at *p*<0.05 and *at *p*<0.10.				

Table 5.20: Endogeneity test for NAS fees model				
Durbin-Wu-Hausman Test				
H_0 = the residual of *LNNAF*, *BRDSIZE*, *BDRNED*, *BRDMEET*, *BRDEXP*, *ACSIZE*, *ACIND1*, *ACMEET* and *ACEXP* are exogenous Reject H_0 if F-statistic significant				
Variable	*LNNAF*	*LNTOTALFEES*	*FEERATIO1*	*FEERATIO2*
	Chi2 (1)			
LNNAF	2.544 (p=0.110)	0.361 (p=0.548)	2.544 (p=0.110)	0.249 (p=0.617)
BRDSIZE	0.188 (p=0.664)	0.191 (p=0.661)	0.188 (p=0.664)	0.021 (p=0.884)
BRDNED	1.492 (p=0.221)	0.133 (p=0.715)	1.492 (p=0.221)	0.076 (p=0.782)
BRDEXP	0.250 (p=0.614)	0.088 (p=0.766)	0.254 (p=0.614)	0.001 (p=0.965)
BRDMEET	0.136 (p=0.711)	0.106 (p=0.744)	0.136 (p=0.711)	0.092 (p=0.760)
ACSIZE	0.016 (p=0.898)	0.930 (p=0.335)	0.016 (p=0.898)	0.269 (p=0.603)
ACIND1	1.299 (p=0.254)	0.185 (p=0.667)	1.299 (p=0.254)	0.188 (p=0.664)
ACEXP	0.101 (p=0.750)	0.026 (p=0.870)	0.101 (p=0.750)	0.031 (p=0.859)
ACMEET	0.205 (p=0.650)	1.069 (p=0.301)	0.205 (p=0.650)	1.026 (p=0.310)

5.6 ANALYSIS II1: INDUSTRY SPECIALIST AUDITOR

5.6.1 Univariate test

Table 5.21 presents the results of mean differences tests for all the variables in the industry specialist model according to the dichotomous definitions of *SPEC_AUD*. Based on the *SPECLST_MSLEADER* and the *SPECLST_30MS* definitionss, industry specialists are employed in 274 and 364 firm-years, while non-specialist auditors are employed in 400 and 310, respectively. In general, the results of the t-test using the *SPECLST_30MS* definition show more significant differences between the groups of auditors in the hypothesis and control variables than using the *SPEC_MSLEADER* definition.

The results of the t-tests of both definitions show that the firms with the larger board size tend to employ industry specialists rather than non-specialist auditors, while the boards with higher levels of financial expertise are more likely to appoint a non-specialist auditor. However, there are no significant differences between the two groups of auditors for firms that have higher percentages of independent board members and higher board meeting frequencies.

In regard to audit committee characteristics, the results of the t-tests suggest that there are significant differences in audit committee size between the two groups of auditors. Both dichotomous definitions suggest that the larger audit committees are more likely to appoint industry specialists than they are to appoint non-specialist auditors. The result for independent audit committees is conditional. Under the *SPECLST_MSLEADER* definition, the results for independent audit committees show no significant difference between these two groups of auditors. However, using the *SPECLST_30MS* definition, the likelihood of firms with solely independent audit committees is higher in the group that employ industry specialist auditors than in the group that employ non-specialist auditors. These findings are consistent with Chen et al. (2005). However, when either definition is used, audit committee expertise and audit committee meeting frequencies do not appear to be associated with any significant difference between the group of firms using industry specialists and the group of firms using non-specialists.

The means that the levels of *LNASSETS*, *LEVERGN*, *SQSUBS* and *FORGNSALE* are higher for firms with specialist auditors, and this is consistent with the argument that: the higher a firms' risk and the higher the complexity of firm operations, the more the need for a higher quality auditor (Collier and Gregory, 1996; Simon and Francis, 1988). In addition, the result also suggests that the firms with higher percentages of total shares owned by the directors *(INOWN)* are more likely to employ non-specialists, and this is consistent with the report found in Abbott and Parker (2000).

5.6.2 Multivariate regression

The results for the *IND_SPEC* model are presented in Table 5.22, by year and by pooled samples.[67] However, *SPECLST_MS,* *SPECLST_PS* and *SPECLST_WEIGHTED* are modelled only on the pooled sample due to the lack of F-statistics for several years. The adjusted R^2s, or pseudo-R^2s, for all models are between 6.2% and 15.9%, and these values are relatively higher than those reported in Abbott et al.' (2003b) and Chen et al.' (2005), who report them to be in between 2 % and 10 %, and 6.7% and 7.6 % respectively.

In general, the regression results for *SPEC_AUD,* which is measured using the market share approach, are relatively consistent across both the year-by-year and the pooled samples. In contradiction to the expectation, the present study finds that *BRDSIZE* is significant and positively related to *SPECLIST_MSLEADER*, *SPECLST_MS30* and *SPECLST_MS* in the year 2005 and in the pooled models but that it is insignificantly related to other measures. Similarly, *BRDNED* is found to be negatively related to *SPECLST_MS30* and *SPECLST_MS* in the year 2007 and in the pooled sample. However, it is insignificant with the *SPECLIST_MSLEADER, SPECLST_PS* and *SPECLST_WEIGHTED.* Likely, *BRDEXP* is also insignificant with all the other auditor industry specialist measures. *BRMEET* is conditional on the auditor industry specialist measures. It is significant and negatively related to *SPECLST_MS* and positively related to *SPECLST_PS*, but it is not significantly related to *SPECLST_MS30*, *SPECLIST_MSLEADER* or *SPECLST_WEIGHTED*.

[67] For the *SPECLIST_MSLEADER* and the *SPECLST_MS30* measures, the present study employs the hetroscedastic ordinal regression and logit regression, since the dependent variable is dichotomous. The hetroscedastic ordinal regression is estimated using the function of the *oglm* command in *Stata*.

Table 5.21: Univariate tests

SPEC_AUD	*SPECLST_MSLEADER*					*SPECLST_30MS*				
	Mean		Std. Dev.		t-test	Mean		Std. Dev.		t-test
Specialization	1 (*N*=274)	0 (*N*=400)	1 (*N*=274)	0 (*N*=400)		1 (*N*=364)	0 (*N*=310)	1 (*N*=364)	0 (*N*=310)	
BRDSIZE	9.843	8.763	2.586	1.965	-6.156***	9.676	8.645	2.529	1.849	-5.947***
BRDNED	0.462	0.453	0.121	0.113	-0.951	0.463	0.449	0.119	0.112	-1.492
BRDEXP	0.327	0.369	0.130	0.148	3.781***	0.341	0.364	0.136	0.149	2.039**
BRDMEET	8.504	8.730	2.400	2.703	1.117	8.574	8.713	2.357	2.830	0.694
ACSIZE	3.762	3.548	0.929	0.758	-3.301***	3.736	3.516	0.934	0.691	-3.427***
ACIND	0.737	0.713	0.441	0.453	-0.703	0.755	0.684	0.430	0.466	-2.073**
ACEXP	0.374	0.397	0.183	0.226	1.346	0.394	0.379	0.189	0.232	-0.927
ACMEET	4.015	4.005	1.155	1.253	-0.101	3.964	4.061	1.087	1.346	1.035
INOWN	3.563	4.638	10.050	13.503	1.122	3.034	5.572	9.005	15.051	2.699***
LNASSET	6.306	6.084	0.612	0.516	-5.068***	6.288	6.041	0.602	0.492	-5.777***
LEVERGN	0.654	0.631	0.224	0.211	-1.348	0.660	0.617	0.212	0.220	-2.586***
NWFUNDRATIO	0.108	0.149	0.261	0.542	1.181	0.102	0.168	0.235	0.611	1.872
ROA	9.949	9.604	7.764	9.946	-0.482	9.639	9.867	7.781	10.484	0.323
SQSUB	4.916	4.556	2.227	1.956	-2.218**	4.937	4.428	2.168	1.931	-3.189
FORGSALE	48.198	43.872	35.268	36.187	-1.540	49.600	40.971	35.472	35.794	-3.134***

Specialization is according to dummy definitions. The value 1 is denotes firms that employ industry specialist auditor, 0 if otherwise. The significant level is based on two tailed tests, *** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10.

ACSIZE is significant and negatively related only to *SPECLST_PS* and *SPECLST_WEIGHTED* in the pooled sample, while *ACIND* is significant and positively related across all the auditor industry specialist measures in the pooled samples, except in *SPECLIST_MSLEADER* model. This positive relationship may suggest that the audit committees comprised solely of independent members are more likely to appoint industry specialist auditors than non-specialist auditors. In contrast to the prediction and the prior documented evidence, the present study finds that in most years and in the pooled sample, *ACMEET* is significant and negatively related to all the auditors industry specialist measures (except *SPECLST_PS),* suggesting that firms with lower audit committee meetings frequencies are more likely to appoint industry specialist auditors. However, *ACEXP* is found to be insignificantly related with all the *IND_SPEC* measures.

INOWN is found to be negatively related to *SPECLST_MS30* and *SPECLST_MS* in pooled sample. This may indicate that, as the percentage of insider ownership increases, there is less need for industry specialist auditors and this is due to the volume of detailed information that is received by the directors. *LNASSET* and *LEVERGN* suggest positive relationships with *IND_SPEC* in most models, suggesting that larger firms and higher leverage firms require more specialist auditors in order to compensate for the increases in agency costs. In contrast to the prediction, *NWFUNDRATIO* is found to be negatively related to the most of *SPEC_AUD* measures, while *ROA, SQSUB* and *FORGNSALE* are positively related to *SPEC_AUD* in most models under the pooled samples. This indicates that higher risk firms and the more complex firms' have an increased need for industry specialist auditors.

Overall, the results for board and audit committee characteristics and related control variables are sensitive to the choice of *SPEC_AUD* measures. However, despite the inconsistent results in year-by-year analysis, in the pooled model, in four out of five of auditor industry specialist measures, *ACIND* and *ACMEET* are found to be significantly related to the use of industry specialist auditors. The firms with audit committees that are comprised solely of independent members are more likely to engage industry specialist auditors. In addition, contrary to the expectation, the higher audit committee meetings frequencies are not necessarily associated to the choice of higher quality auditors.

Table 5.22: The results of multivariate regression for auditor industry specialist model

$$SPEC\_AUD = \alpha_0 + \beta_1 BRDSIZE + \beta_2 BRDNED + \beta_3 BRDEXP + \beta_4 BRDMEET + \beta_5 ACSIZE + \beta_6 ACIND + \beta_7 ACEXP + \beta_8 ACMEET + \beta_9 INOWN + \beta_{10} LNASSET + \beta_{11} LEVERG + \beta_{12} NWFUNDRATIO + \beta_{13} ROA + \beta_{14} SQSUB + \beta_{15} FORGSALE + \varepsilon$$

The dependent variable of ***SPEC_AUD*** is measured as follows:
(1) *SPECLST_MSLEADER* ; (2) *SPECLST_MS30;* (3) *SPECLST_MS;* (4) *SPECLST_PS;* and (5) *SPECLST_WEIGHTED*

Variable	Coefficient (*t-statistics*)[a]												
	2005 (*N*=167)		2006 (*N*=181)		2007 (*N*=181)		2008 (*N*=145)		Pooled (N=674)				
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(3)	(4)	(5)
Intercept	6.068 (2.59)**	7.257 (2.98)***	4.785 (2.00)**	5.267 (2.16)**	3.640 (1.51)	4.718 (1.84)*	5.973 (2.13)**	8.996 (2.99)**	4.426 (3.86)***	5.952 (4.93)***	-0.187 (-1.66)*	0.097 (1.47)	-0.019 (-0.65)
BRDSIZE	0.291 (2.28)**	0.293 (2.31)**	0.144 (1.37)	0.029 (0.27)	0.055 (0.50)	0.046 (0.39)	0.173 (1.41)	0.225 (1.78)*	0.126 (2.39)**	0.114 (2.09)**	0.014 (2.84)***	-0.005 (-1.50)	0.000 (0.23)
BRDNED	-0.390 (-0.18)	-1.812 (-0.85)	-0.081 (-0.04)	-1.276 (-0.60)	-3.126 (-1.53)	-5.227 (-2.37)**	0.417 (0.18)	0.603 (0.26)	-0.898 (-0.90)	-1.778 (-1.74)*	-0.215 (-2.26)**	-0.045 (-0.73)	-0.037 (-1.33)
BRDEXP	-0.838 (-0.48)	0.074 (0.04)	-2.449 (-1.45)	-2.980 (-1.77)*	-0.833 (-0.55)	-0.255 (-0.17)	0.162 (0.08)	0.822 (0.40)	-1.154 (-1.43)	-0.712 (-0.88)	0.008 (0.11)	-0.018 (-0.36)	-0.030 (-1.35)
BRDMEET	0.005 (0.06)	0.012 (0.15)	-0.071 (-1.06)	-0.062 (-0.99)	0.110 (1.46)	0.130 (1.64)	-0.050 (-0.58)	-0.007 (-0.08)	-0.011 (-0.31)	0.010 (0.30)	-0.007 (-2.06)**	0.007 (2.98)***	0.002 (1.38)
ACSIZE	-0.218 (-0.78)	-0.177 (-0.64)	-0.359 (-1.31)	0.180 (0.62)	0.426 (1.50)	0.545 (1.63)	0.004 (0.01)	-0.242 (-0.84)	0.020 (0.17)	0.069 (0.54)	0.006 (0.54)	-0.017 (-2.25)**	-0.006 (-1.80)*
ACIND	0.224 (0.50)	0.212 (0.48)	0.543 (1.18)	0.528 (1.16)	-0.141 (-0.33)	0.627 (1.39)	0.723 (1.25)	0.908 (1.70)*	0.234 (1.09)	0.491 (2.25)**	0.042 (1.95)**	0.037 (2.76)***	0.015 (2.42)**
ACEXP	0.384 (0.33)	0.475 (0.42)	1.011 (0.88)	2.465 (2.11)**	0.224 (0.26)	0.982 (1.06)	-1.569 (-1.19)	-0.265 (-0.20)	0.039 (0.08)	0.825 (1.54)	-0.021 (-0.43)	0.036 (1.08)	0.017 (1.07)
ACMEET	-0.326 (-1.91)*	-0.392 (-2.33)**	-0.226 (-1.37)	-0.168 (-1.03)	-0.276 (-1.65)*	-0.438 (-2.55)**	0.344 (1.62)	-0.122 (-0.58)	-0.151 (-1.92)*	-0.291 (-3.63)***	-0.021 (-3.16)***	-0.006 (-1.05)	-0.004 (-1.66)*

Table 5.22 (continued)

INOWN	0.001 *(0.08)*	-0.003 *(-0.23)*	0.003 *(0.19)*	-0.011 *(-0.67)*	-0.018 *(-1.12)*	-0.034 *(-1.75)**	-0.017 *(-0.71)*	-0.028 *(-1.24)*	-0.006 *(-0.79)*	-0.016 *(-2.08)***	-0.001 *(-3.05)****	0.000 *(0.62)*	-0.000 *(-0.11)*
LNASSET	0.638 *(1.53)*	1.052 *(2.47)***	0.882 *(1.94)***	0.819 *(1.79)**	0.369 *(0.86)*	0.500 *(1.11)*	0.552 *(1.15)*	1.037 *(2.08)***	0.571 *(2.79)****	0.847 *(3.99)****	0.087 *(4.35)****	-0.004 *(-0.31)*	0.010 *(1.84)**
LEVERGN	1.609 *(1.77)**	1.552 *(1.70)*	0.004 *(0.01)*	0.491 *(0.67)*	0.552 *(0.63)*	1.683 *(1.80)**	-0.478 *(-0.44)*	0.757 *(0.70)*	0.423 *(1.06)*	0.918 *(2.19)***	0.063 *(1.53)*	0.072 *(2.74)****	0.034 *(2.92)****
NWFUNDRATIO	0.758 *(0.68)*	0.343 *(0.31)*	-0.148 *(-0.29)*	-0.382 *(-0.73)*	-0.911 *(-1.21)*	-1.489 *(-1.76)**	-1.908 *(-1.08)*	-0.709 *(-0.41)*	-0.320 *(-1.01)*	-0.651 *(-1.78)**	-0.018 *(-1.35)*	-0.037 *(-4.48)****	-0.013 *(-3.25)****
ROA	0.008 *(0.35)*	-0.019 *(-0.77)*	0.031 *(1.40)*	0.019 *(0.90)*	0.001 *(0.06)*	0.003 *(0.17)*	0.048 *(2.06)***	0.043 *(1.95)**	0.017 *(1.73)**	0.013 *(1.34)*	0.002 *(1.83)**	0.000 *(0.50)*	0.000 *(0.96)*
SQSUB	0.002 *(0.02)*	-0.061 *(-0.65)*	0.065 *(0.76)*	0.084 *(0.96)*	0.087 *(1.02)*	0.104 *(1.13)*	-0.076 *(-0.75)*	-0.019 *(-0.18)*	0.036 *(0.83)*	0.041 *(0.94)*	0.001 *(0.18)*	0.013 *(5.05)****	0.005 *(3.80)****
FORGSALE	0.003 *(0.58)*	0.002 *(0.27)*	0.000 *(0.06)*	0.007 *(1.25)*	0.004 *(0.69)*	0.010 *(1.69)*	-0.005 *(-0.73)*	0.010 *(1.62)*	0.001 *(0.52)*	0.007 *(2.57)****	0.000 *(0.90)*	0.001 *(5.49)****	0.000 *(3.24)****
Adj. R^2/ Pseudo R^2	0.120	0.137	0.092	0.108	0.103	0.168	0.134	0.159	0.062	0.099	0.127	0.148	0.095

*** are significant at $p<0.01$, ** are significant at $p<0.05$ and *at $p<0.10$, a=*z-statistics* for hetroskedastic ordinal regression.

5.6.3 The additional analyses and robustness tests

Several tests are performed to observe whether the main results of the auditor industry specialist models are robust to various other model specifications. These tests include the heteroscedasticity and multicollinearity check, different regression estimators, alternative definitions of hypotheses variables, additional control variables, an endogeneity test and the 2SLS regression.

5.6.3.1 Heteroscedasticity and multicollinearity checks

The results of heteroscedasticity test are presented in Table 5.23, according to the specific auditor industry specialist measures. All models indicate significant *p*-values that range from $p<0.01$ and $p<0.10$, suggesting that the models are heteroscedastic.[68]

Table 5.24 presents the result of VIF and tolerance values.[69] None of the variables had a VIF value of more than 10 or a tolerance value lower than 0.10. This may suggest that the models had no indication of a multicollinearity problem.

5.6.3.2 Different regression estimators

Previously, *SPEC_MSLEADER* and *SPECLST_MS30* were estimated using heteroscedastic ordinal regression and the other measures were regressed using a least square regression with robust standard errors, which is efficient in controlling for heteroscedasticity. As the benchmark of comparison, in this section, *SPEC_MSLEADER* and *SPECLST_MS30* regressed using probit regression, while other measures are estimated using OLS and GLS regressions. The results are presented in Table 5.25. As can be seen, the results of GLS, OLS and Probit regressions are relatively consistent with the main finding, suggesting that the main results are robust to different regression estimators.

[68] For dependent variable which is a continuous version (e.g. *SPECLST_MS*, *SPECLST_PS* and *SPECLST_WEIGHTED*), the heteroscedasticity test was performed using the Breusch-Pagan or Cook-Weisberg test, while for dichotomous version (e.g. *SPECLST_MSLEADER* and *SPECLST_MS30*), the present study used the heteroskedasticity test for Logit/ Probit model that available in *Stata* program by using the *hetprob* command.

[69] This result is based on the modelling of *SPECLST_WEIGHTED* as a dependent variable. The other models indicate relatively similar VIF and tolerance values.

5.6.3.3 New definitions for board and audit committee variables

As with the audit fees and NAS fees model, new definitions of board and audit committee variables are introduced to see whether the results are robust to alternative specifications of variables. Following the approach of Abbott et al. (2003) and DeFond et al. (2005), the variables are: (1) *BRDSIZE1*, which is coded as 1 if the firm's board size is less than the sample median, and 0 if otherwise; (2) *BRDNED1*, which is coded as 1 if 60% of the firm's directors are independent, and 0 if otherwise; (3) *ACIND1*, which is defined as the proportion of independent non-executive directors on the audit committee; (4) *ACEXP1*, which is coded as 1 if the audit committee has at least one director who is equipped with financial expertise, and 0 if otherwise; (5) *ACMEET1*, which is is coded as 1 if the audit committee meeting frequency is more than the sample median, and 0 if otherwise. The other variable definitions remained unchanged.

The results are presented in Table 5.26. The main results suggest that, in the pooled sample, four out of five *SPEC_AUD* measures indicate that audit committees with solely independent members and lower audit committee meetings frequencies are associated with a greater likelihood of industry specialist auditors being chosen. However, when the new definitions are introduced to audit committee independence variable and audit committee meeting frequency variable, none of these variables are significant (except for *ACMEET1* and *SPECLST_MS30*). In addition, the present study finds consistent evidence that firms with audit committees with at least one member equipped with financial expertise are more likely to employ industry specialist auditor. In summary, the results for *ACIND* and *ACMEET* in the main findings are sensitive to new definitions.

5.6.3.4 Additional control variables

In line with the audit fees and NAS fees models, several control variables are included in the primary model to see whether the inclusion of these variables affect the results. These variables are liquidity ratio *(LIQ)*, and growth *(GROWTH)*, which are predicted to be positively related to the employment of industry specialist auditors. Prior literature suggests that higher risk firms and higher growth firms are associated with higher agency cost (Francis and Wilson, 1988; Firth and Smith, 1992) and that they are thus likely to engage industry specialist auditor. The results are presented in Table

5.27. The results for hypothesis variables and the main control variables are relatively similar to the main findings. *LIQ* and *GROWTH* are insignificant to all *SPEC_AUD* measures. Overall, the main finding is unchanged and the additional control variables are unlikely to affect the results.

5.6.3.5 Endogeneity and two-stage least squares (2SLS) regression

In line with the approach used with the previous models, the present study performs the Durbin-Wu-Hausman test (for continuous dependent variables) and the Wald test (for dichotomous dependent variables) to see whether the corporate governance variables are associated with the endogeneity problem. *BRDSIZE, BDRNED, BRDMEET, BRDEXP, ACSIZE, ACIND1, ACMEET* and *ACEXP* are treated as endogenous variables. The results of the Durbin-Wu-Hausman test are presented in Table 5.28. As can be seen, most of the corporate governance variables show insignificant F-statistics, except for *BRDSIZE* (in the *SPECLST_MSLEADER* model), *BDRMEET* (for the *SPECLIST_MS* and the *SPECLST_WEIGHTED* measures) and *ACMEET* (for most of *SPEC_AUD* measures), each of which suggest significant F-statistics, indicating the presence of endogeneity.

Furthermore, 2SLS tests are performed on selected models that contain endogenous variables in order to mitigate the potential bias in the main model of *SPEC_AUD*.[70] Table 5.29 presents the results of 2SLS regressions. The results are relatively similar to the main findings. *ACIND* is positively and significantly related with *SPEC_AUD* (except *SPECLST_MSLEADER*), while ACMEET has a negative relationship to *SPEC_AUD*, suggesting that the audit committees that are comprised solely of independent members and that have a lower frequency of meetings are more likely to appoint industry specialist audits. This is consistent with the inference that is made from the main findings. The others hypotheses variables and control variables remain unchanged.

[70] For the models that have dichotomous dependent variables the 2SLS test are regressed using the Stata command, *ivprobit*, while for the models that contained continuous dependent variables the command is *ivregress*.

Table 5.23: Heteroscedasticity test for auditor industry specialist model		
H_0 = The variance of the residuals is constant Reject H_0 if p-value is significant		
Dependent variable	chi2	Prob > chi2
SPECLST_MSLEADER	27.99	0.000
SPECLST_30MS	35.97	0.000
SPECLIST_MS	5.67	0.017
SPECLIST_PS	33.63	0.000
SPECLST_WEIGHTED	17.01	0.000

Table 5.24: VIF and tolerance values for auditor industry specialist model		
Variables	VIF	Tolerance
BRDSIZE	2.08	0.481
BRDNED	2.00	0.500
LNASSET	1.93	0.518
BRDEXP	1.92	0.522
ACEXP	1.72	0.581
ACSIZE	1.60	0.624
ACIND	1.38	0.726
ACMEET	1.28	0.780
FORGSALE	1.27	0.786
BRDMEET	1.21	0.825
SQSUB	1.18	0.845
LEVERG	1.12	0.896
INOWN	1.10	0.912
ROA	1.09	0.914
NWFUNDRATIO	1.03	0.975
Mean VIF	1.46	

Table 5.25: The results of different estimators for auditor industry specialist model (*N*=674)

Variable	Coefficient *(t-statistics)*[a]							
	GLS regression			OLS regression			Probit regression	
	SPECLST_MS	*SPECLST_PS*	*SPECLST_ WEIGHTED*	*SPECLST_MS*	*SPECLST_PS*	*SPECLST_ WEIGHTED*	*SPECLST_ MSLEADER*	*SPECLST_MS30*
Intercept	-0.167 *(-1.46)*	0.091 *(1.33)*	-0.020 *(-0.67)*	-0.187 *(-1.74)**	0.097 *(1.34)*	-0.019 *(-0.58)*	-2.702 *(-3.89)****	-3.618 *(-5.00)****
BRDSIZE	0.014 *(2.92)****	-0.005 *(-1.53)*	0.000 *(0.21)*	0.014 *(2.76)****	-0.005 *(-1.44)*	0.000 *(0.25)*	0.077 *(2.41)***	0.070 *(2.13)***
BRDNED	-0.216 *(-2.26)***	-0.047 *(-0.76)*	-0.038 *(-1.36)*	-0.215 *(-2.25)***	-0.045 *(-0.70)*	-0.037 *(-1.27)*	-0.580 *(-0.94)*	-1.120 *(-1.81)**
BRDEXP	-0.005 *(-0.07)*	-0.015 *(-0.30)*	-0.030 *(-1.35)*	0.008 *(0.11)*	-0.018 *(-0.35)*	-0.030 *(-1.29)*	-0.715 *(-1.45)*	-0.440 *(-0.90)*
BRDMEET	-0.006 *(-1.83)**	0.007 *(3.08)****	0.002 *(1.58)*	-0.007 *(-2.02)***	0.007 *(3.09)****	0.002 *(1.47)*	-0.007 *(-0.32)*	0.006 *(0.28)*
ACSIZE	0.006 *(0.50)*	-0.016 *(-2.12)***	-0.006 *(-1.73)**	0.006 *(0.55)*	-0.017 *(-2.07)***	-0.006 *(-1.72)**	0.014 *(0.18)*	0.044 *(0.56)*
ACIND	0.041 *(1.87)**	0.037 *(2.76)****	0.015 *(2.41)***	0.042 *(2.04)***	0.037 *(2.65)****	0.015 *(2.33)***	0.143 *(1.09)*	0.304 *(2.30)***
ACEXP	-0.009 *(-0.19)*	0.039 *(1.16)*	0.020 *(1.27)*	-0.021 *(-0.43)*	0.036 *(1.08)*	0.017 *(1.10)*	0.026 *(0.08)*	0.481 *(1.56)*
ACMEET	-0.021 *(-3.09)****	-0.006 *(-1.20)*	-0.005 *(-1.82)***	-0.021 *(-2.89)****	-0.006 *(-1.12)*	-0.004 *(-1.92)**	-0.091 *(-1.91)**	-0.177 *(-3.68)****
INOWN	-0.001 *(-2.88)****	0.000 *(0.69)*	-0.000 *(-0.01)*	-0.001 *(-2.11)***	0.000 *(0.62)*	-0.000 *(-0.11)*	-0.004 *(-0.80)*	-0.010 *(-2.15)***

Table 5.25 (continued)								
LNASSET	0.084 *(4.11)****	-0.003 *(-0.27)*	0.010 *(1.82)**	0.087 *(4.56)****	-0.004 *(-0.29)*	0.010 *(1.69)**	0.347 *(2.80)****	0.515 *(4.06)****
LEVERGN	0.052 *(1.26)*	0.065 *(2.43)***	0.030 *(2.54)***	0.063 *(1.57)*	0.072 *(2.78)****	0.034 *(2.88)****	0.275 *(1.12)*	0.574 *(2.33)***
NWFUNDRATIO	-0.019 *(-1.53)*	-0.036 *(-4.76)****	-0.012 *(-3.52)****	-0.018 *(-1.03)*	-0.037 *(-3.09)****	-0.013 *(-2.37)***	-0.182 *(-1.01)*	-0.370 *(-1.87)**
ROA	0.002 *(1.74)**	0.000 *(0.61)*	0.000 *(1.05)*	0.002 *(2.06)***	0.000 *(0.39)*	0.000 *(0.78)*	0.010 *(1.75)**	0.008 *(1.37)*
SQSUB	0.000 *(0.10)*	0.014 *(5.47)****	0.005 *(4.13)****	0.001 *(0.16)*	0.013 *(4.85)****	0.005 *(3.86)****	0.023 *(0.86)*	0.025 *(0.94)*
FORGSALE	0.000 *(1.15)*	0.001 *(5.43)****	0.000 *(3.36)****	0.000 *(0.96)*	0.001 *(5.31)****	0.000 *(3.28)****	0.001 *(0.56)*	0.004 *(2.58)***
Adj. R^2/ Pseudo R^2	0.120	0.153	0.100	0.127	0.148	0.095	0.062	0.100

*** are significant at *p*<0.01, ** are significant at *p*<0.05 and *at *p*<0.10, a=*z-statistics* for probit regression.

Table 5.26: The results of auditor industry specialist model for the alternative test variable definitions (*N*=674)					
Variable	Coefficient *(t-statistics)*[a]				
	(1)	(2)	(3)	(4)	(5)
Intercept	4.364 *(3.27)****	5.820 *(4.24)****	-0.124 *(-0.97)*	-0.014 *(-0.17)*	-0.049 *(-1.40)*
BRDSIZE1	-0.252 *(-1.27)*	-0.279 *(-1.42)*	-0.020 *(-1.04)*	0.017 *(1.25)*	0.002 *(0.30)*
BRDNED1	-0.101 *(-0.52)*	-0.203 *(-1.07)*	-0.007 *(-0.37)*	-0.021 *(-1.65)**	-0.008 *(-1.49)*
BRDEXP	-1.989 *(-2.94)****	-0.863 *(-1.32)*	-0.080 *(-1.29)*	-0.016 *(-0.38)*	-0.036 *(-1.90)**
BRDMEET	-0.032 *(-0.94)*	-0.018 *(-0.55)*	-0.010 *(-3.13)****	0.007 *(3.24)****	0.001 *(1.14)*
ACSIZE	0.040 *(0.31)*	0.039 *(0.32)*	0.007 *(0.66)*	-0.019 *(-2.73)****	-0.007 *(-2.19)***
ACIND1	-0.276 *(-0.82)*	-0.124 *(-0.42)*	-0.030 *(-1.09)*	0.037 *(1.22)*	0.007 *(0.68)*
ACEXP1	1.073 *(2.88)****	1.124 *(3.13)****	0.044 *(1.19)*	0.064 *(3.34)****	0.029 *(2.95)****
ACMEET1	-0.118 *(-0.58)*	-0.426 *(-2.06)***	-0.028 *(-1.47)*	-0.002 *(-0.18)*	-0.005 *(-0.76)*
INOWN	-0.003 *(-0.37)*	-0.012 *(-1.57)*	-0.001 *(-2.31)***	0.000 *(0.73)*	0.000 *(0.18)*
LNASSET	0.580 *(3.16)****	0.748 *(3.94)****	0.080 *(4.54)****	-0.007 *(-0.62)*	0.009 *(1.77)**
LEVERGN	0.442 *(1.11)*	0.917 *(2.23)***	0.068 *(1.62)*	0.074 *(2.85)****	0.035 *(3.05)****
NWFUNDRATIO	-0.277 *(-0.90)*	-0.631 *(1.72)**	-0.018 *(-1.33)*	-0.036 *(-4.46)****	-0.013 *(-3.35)****
ROA	0.014 *(1.48)*	0.010 *(1.00)*	0.002 *(1.52)*	0.000 *(0.28)*	0.000 *(0.69)*
SQSUB	0.055 *(1.30)*	0.056 *(1.30)*	0.003 *(0.90)*	0.013 *(5.14)****	0.006 *(4.08)****
FORGSALE	0.001 *(0.27)*	0.006 *(2.27)**	0.000 *(0.26)*	0.001 *(5.81)****	0.000 *(3.32)****
Adj. R^2/ Pseudo R^2	0.062	0.085	0.099	0.150	0.093
The dependent variable of ***SPEC_AUD*** is measured as follows: (1) *SPECLST_MSLEADER ;* (2) *SPECLST_MS30;* (3) *SPECLST_MS;* (4) *SPECLST_PS;* and (5) *SPECLST_WEIGHTED* *** are significant at $p<0.01$, ** are significant at $p<0.05$ and *at $p<0.10$, a=*z-statistics* for hetroskedastic ordinal regression.					

Table 5.27: The results of auditor industry specialist model with the additional control variables (*N*=674)					
Variable	Coefficient *(t-statistics)*[a]				
	(1)	(2)	(3)	(4)	(5)
Intercept	4.458 *(3.87)****	5.924 *(4.90)****	-0.190 *(-1.68)**	0.094 *(1.40)*	-0.020 *(-0.69)*
BRDSIZE	0.127 *(2.40)***	0.113 *(2.05)***	0.014 *(2.88)****	-0.005 *(-1.43)*	0.000 *(0.27)*
BRDNED	-1.043 *(-1.03)*	-1.882 *(-1.83)**	-0.218 *(-2.28)***	-0.051 *(-0.84)*	-0.042 *(-1.46)*
BRDEXP	-1.147 *(-1.42)*	-0.724 *(-0.89)*	0.009 *(0.12)*	-0.017 *(-0.33)*	-0.030 *(-1.31)*
BRDMEET	-0.011 *(-0.30)*	0.010 *(0.28)*	-0.007 *(-2.05)**	0.007 *(2.99)****	0.002 *(1.39)*
ACSIZE	0.016 *(0.13)*	0.068 *(0.53)*	0.006 *(0.52)*	-0.017 *(-2.31)***	-0.006 *(-1.86)**
ACIND	0.244 *(1.13)*	0.497 *(2.28)***	0.042 *(1.95)**	0.037 *(2.77)****	0.015 *(2.44)***
ACEXP	0.046 *(0.09)*	0.858 *(1.59)*	-0.023 *(-0.46)*	0.035 *(1.03)*	0.016 *(1.03)*
ACMEET	-0.150 *(-1.90)**	-0.288 *(-3.58)****	-0.021 *(-3.17)****	-0.006 *(-1.07)*	-0.004 *(-1.65)**
INOWN	-0.005 *(-0.73)*	-0.015 *(-1.99)***	-0.001 *(-3.07)****	0.000 *(0.60)*	-0.000 *(-0.09)*
LNASSET	0.589 *(2.87)****	0.856 *(4.02)****	0.088 *(4.38)****	-0.003 *(-0.23)*	0.011 *(1.97)***
LEVERGN	0.416 *(1.03)*	0.894 *(2.11)***	0.065 *(1.54)*	0.073 *(2.76)****	0.034 *(2.88)****
NWFUNDRATIO	-0.246 *(-0.79)*	-0.576 *(-1.64)*	-0.018 *(-1.31)*	-0.035 *(-4.56)****	-0.012 *(-3.32)****
ROA	0.017 *(1.78)**	0.014 *(1.39)*	0.002 *(1.82)**	0.000 *(0.51)*	0.000 *(1.00)*
SQSUB	0.037 *(0.87)*	0.043 *(0.97)*	0.001 *(0.18)*	0.013 *(5.04)****	0.005 *(3.80)****
FORGSALE	0.002 *(0.62)*	0.007 *(2.62)****	0.000 *(0.92)*	0.001 *(5.49)****	0.000 *(3.32)****
LIQ	-0.274 *(-0.84)*	-0.072 *(-0.22)*	-0.018 *(-0.53)*	0.000 *(0.09)*	-0.012 *(-1.23)*
GROWTH	-0.002 *(-0.54)*	-0.003 *(-0.75)*	0.000 *(0.19)*	-0.024 *(-1.14)*	-0.000 *(-0.26)*
Adj. R^2/ Pseudo R^2	0.064	0.100	0.127	0.149	0.098

The dependent variable of ***SPEC_AUD*** is measured as follows:
(1) *SPECLST_MSLEADER ;* (2) *SPECLST_MS30;* (3) *SPECLST_MS;* (4) *SPECLST_PS;* and (5) *SPECLST_WEIGHTED*
*** are significant at *p*<0.01, ** are significant at *p*<0.05 and *at *p*<0.10, a=*z-statistics* for hetroskedastic ordinal regression.

Table 5.28: Endogeneity test for industry specialist model					
Durbin-Wu-Hausman Test and Wald test					
H_0 = the residual of *BRDSIZE*, *BDRNED*, *BRDMEET*, *BRDEXP*, *ACSIZE*, *ACIND1*, *ACMEET* and *ACEXP* are exogenous Reject H_0 if F-statistic significant					
Variable	Chi2 (1)				
	(1)	(2)	(3)	(4)	(5)
BRDSIZE	3.74 (p=0.053)	2.58 (p=0.108)	2.620 (p=0.105)	0.238 (p=0.625)	2.620 (p=0.105)
BRDNED	0.11 (p=0.744)	0.44 (p=0.506)	0.048 (p=0.825)	0.079 (p=0.779)	0.048 (p=0.825)
BRDEXP	0.24 (p=0.624)	0.03 (p=0.868)	0.004 (p=0.984)	0.062 (p=0.802)	0.000 (p=0.984)
BRDMEET	0.32 (p=0.574)	0.65 (p=0.421)	2.813 (p=0.093)	1.351 (p=0.245)	2.813 (p=0.093)
ACSIZE	0.03 (p=0.866)	0.18 (p=0.670)	0.198 (p=0.656)	0.210 (p=0.646)	0.198 (p=0.656)
ACIND1	1.01 (p=0.315)	0.86 (p=0.354)	0.080 (p=0.777)	1.339 (p=0.247)	0.080 (p=0.777)
ACEXP	0.41 (p=0.520)	0.68 (p=0.410)	0.078 (p=0.780)	0.497 (p=0.480)	0.077 (p=0.780)
ACMEET	10.06 (p=0.001)	5.67 (p=0.017)	7.47 (p=0.006)	1.507 (p=0.219)	7.470 (p=0.006)
The dependent variable of ***SPEC_AUD*** is measured as follows: (1) *SPECLST_MSLEADER ;* (2) *SPECLST_MS30;* (3) *SPECLST_MS;* (4) *SPECLST_PS;* and (5) *SPECLST_WEIGHTED*					

Table 5.29: The results of 2SLS regression for auditor industry specialist model (*N*=674)							
Variable	Coefficient *(t-statistics)*						
	SPECLST_MSLEADER		*SPECLST_ MS30*	*SPECLST_MS*		*SPECLST_WEIGHTED*	
	BRDSIZE	*ACMEET*	*ACMEET*	*BRDMEET*	*ACMEET*	*BRDMEET*	*ACMEET*
Intercept	-2.612 *(-3.76)******	-2.859 *(-4.15)******	-3.743 *(5.19)******	-0.158 *(-1.40)*	-0.209 *(-1.88)**	-0.021 *(-0.70)*	-0.023 *(-0.82)*
BRDSIZE	0.123 *(3.09)*******	0.092 *(2.89)*******	0.084 *(2.51)****	0.013 *(2.65)******	0.016 *(3.24)******	0.000 *(0.27)*	0.001 *(0.49)*
BRDNED	-0.320 *(-0.51)*	-0.269 *(-0.43)*	0.903 *(-1.45)*	-0.211 *(-2.25)****	-0.179 *(-1.88)**	-0.037 *(-1.35)*	-0.030 *(-1.09)*
BRDEXP	-0.449 *(-0.87)*	-0.537 *(-1.09)*	*-0.321(-0.66)*	0.003 *(0.04)*	0.028 *(0.39)*	-0.029 *(-1.34)*	-0.026 *(1.18)*
BRDMEET	-0.001 *(-0.06)*	0.009 *(0.39)*	0.018 *(0.81)*	-0.010 *(-2.51)****	-0.005 *(-1.43)*	0.002 *(1.33)*	0.002 *(1.68)**
ACSIZE	-0.029 *(-0.37)*	-0.002 *(-0.03)*	0.030 *(0.38)*	0.007 *(0.57)*	0.004 *(0.35)*	-0.006 *(-1.83)**	-0.007 *(-1.93)**
ACIND	0.116 *(0.88)*	0.101 *(0.77)*	0.271 *(2.05)****	0.043 *(2.03)****	0.037 *(1.73)**	0.015 *(2.43)****	0.014 *(2.32)****
ACEXP	-0.091 *(-0.28)*	-0.061 *(-0.20)*	0.421 *(1.37)*	-0.020 *(-0.42)*	-0.032 *(-0.66)*	0.016 *(1.08)*	0.014 *(0.349)*
ACMEET	-0.103 *(-2.15)****	-0.245 *(-3.70)******	-0.286 *(-4.38)******	-0.019 *(-2.92)******	-0.039 *(-4.07)******	-0.004 *(-1.69)**	-0.008 *(-2.24)****
INOWN	-0.004 *(-0.86)*	-0.004 *(-0.95)*	-0.010 *(-2.24)****	-0.002 *(3.23)******	-0.001 *(-3.20)******	-0.000 *(-0.09)*	-0.000 *(-0.19)*
LNASSET	0.275 *(2.12)****	0.407 *(3.29)******	0.557 *(4.48)******	0.088 *(4.39)******	0.095 *(4.74)******	0.010 *(1.86)**	0.011 *(2.10)****
LEVERGN	0.239 *(0.97)*	0.296*(1.21)*	0.588 *(2.39)****	0.069 *(1.67)**	0.066 *(1.62)*	0.033 *(2.90)******	0.034 *(3.02)******
NWFUNDRATIO	-0.189 *(-1.04)*	-0.146 *(-0.86)*	-0.338 *(-1.72)**	-0.017 *(-1.31)*	-0.017 *(-1.30)*	-0.013 *(-3.30)******	-0.013 *(-3.22)******
ROA	0.010 *(1.69)**	0.012 *(2.04)****	0.009 *(1.58)*	0.002 *(1.81)**	0.002 *(2.05)****	0.000 *(0.98)*	0.000 *(1.14)*
SQSUB	0.017 *(0.64)*	0.022 *(0.84)*	0.025 *(0.93)*	0.000 *(0.21)*	0.001 *(0.16)*	0.005 *(3.83)******	0.005 *(3.84)******
FORGSALE	0.001 *(0.47)*	0.001 *(0.78)*	0.004 *(2.74)******	0.000 *(0.74)*	0.000 *(1.11)*	0.002 *(3.26)******	0.000 *(3.37)******
Adj. R^2	-	-	-	0.125	0.118	0.095	0.092
*** are significant at *p*<0.01, ** are significant at *p*<0.05 and *at *p*<0.10							

5.7 Summary

This chapter reports the empirical findings on the effects of the characteristics of boards of directors and audit committees on audit quality. The hypothesis variables for the size of committees, the proportion of independent members, the financial expertise and meeting frequencies of boards of directors and audit committees are examined under three models of audit quality: audit fees, NAS fees and the use of industry specialist auditors. Higher audit fees, lower NAS fees and the engagement of auditor industry specialists are all associated with higher quality audits.

In the audit fees model, the multivariate regression suggests that independent boards are positively related to audit fees. These may imply that independent boards use their oversight function to demand extensive audit efforts from auditors, resulting in higher audit fees. The other characteristics of boards and audit committees provide inconsistent results with audit fees across the years and in the pooled samples. The control variables are significant in the predicted direction, except of *RECINV*, which is found to be insignificantly related to audit fees. The result for independent board is robust to various model specifications including different estimators, clients' size analysis, alternative definitions of hypotheses variables, additional control variables and 2SLS regression.

There are four measures of auditor independence *(FEE)* examined in the NAS model: *LNNAF*, *LNTOTALFEE*, *FEERATIO1* and *FEERATIO2*. The present study finds positive relationship between independent board and *FEE*, specifically the *LNNAF* and *LNTOTALFEES* measures, in most year-by-year analysis and pooled samples. *FEERATIO1* and *FEERATIO2* are insignificantly related to the independent board but report similar positive coefficients. Prior studies suggest that the auditor independence measured by the *LNNAF* and *LNTOTALFEES* are better than NAS fees ratios when it comes to capturing the economic importance of the client-auditor relationship (Ashbaugh et al., 2003; Larcker and Richardson, 2004). The positive relationship may suggest that independent boards seem to support that higher provision of NAS are not necessarily compromise the audit independence, but may enhance the quality of audits due to the knowledge spillover effects. The knowledge spillover effects broaden the auditors' knowledge and improved the audit judgment, which in turn results in a higher audit quality. The other hypothesis variables provide inconsistent support to be linked with NAS. Among the control variables, *LNASSET* is found to be the main determinant for NAS in most year-by-year and pooled sample. The results for independent non-executive director on boards are robust to various model specifications and tests.

In the auditor industry specialist model, five measures of *SPEC_AUD* are employed: *SPECLST_MSLEADER*, *SPECLST_30MS*, *SPECLIST_MS*, *SPECLIST_PS* and *SPECLST_WEIGHTED.* The multivariate regressions of *SPEC_AU*D models suggest that the characteristics of board and audit committee and related control variables are sensitive to the choice of *SPEC_AUD* measures. However, in the pooled sample, when four out of five *SPEC_AUD* measures are used, the results suggest that the firms with audit committees that are comprised solely of independent members and also have a lower number of meetings are more likely to engage industry specialist auditors. Although these results are robust to different estimators and the 2SLS test, they are sensitive to new variable definitions. When the definition of *ACIND* is changed from sole independence to the proportion of independent members (i.e. *ACIND1*) and the definition of *ACMEET* is changed from total number of meeting to is dichotomous variable (coded as 1 if audit committee meeting is more than the sample median, and 0 if otherwise), the results are no longer significant. The summary of the hypothesis and findings are presented in Table 5.30. The significant findings are based on the consistency of the results in year-by-year analysis and pooled samples.

Table 5.30: The summary of the hypothesis and the findings – the relationship between the corporate governance characteristics' and auditor quality.

Hypotheses	Findings
H_1: There is a negative relationship between the board's size and audit fees.	Not supported
H_2: There is a positive relationship between the board's size and NAS fees.	Not supported
H_3: There is a negative relationship between the board's size and the engagement of industry specialist auditor	Not supported
H_4: There is a positive relationship between the independent board and audit fees.	Supported

Table 5.30 (continued)	
H_5: There is a negative relationship between the independent board and NAS fees.	Not supported
H_6: There is a positive relationship between the independent board and the engagement of industry specialist auditor	Not supported
H_7: There is a positive relationship between the board's financial expertise and audit fees.	Not supported
H_8: There is a negative relationship between the board's financial expertise and NAS fees.	Not supported
H_9: There is a positive relationship between the board's financial expertise and the engagement of industry specialist auditor	Not supported
H_{10}: There is a positive relationship between the board's meeting frequency and audit fees.	Not supported
H_{11}: There is a negative relationship between the board's meeting frequency and NAS fees.	Not supported
H_{12}: There is a positive relationship between the board's meeting frequency and the engagement of industry specialist auditor	Not supported
H_{13}: There is a positive relationship between the audit committee's size and audit fees.	Not supported
H_{14}: There is a negative relationship between the audit committee's size and NAS fees.	Not supported
H_{15}: There is a positive relationship between the audit committee's size and the engagement of industry specialist auditor	Not supported
H_{16}: There is a positive relationship between the solely independent audit committee and audit fees.	Not supported
H_{17}: There is a negative relationship between the solely independent audit committee and NAS fees.	Not supported
H_{18}: There is a positive relationship between the solely independent audit committee and the engagement of industry specialist auditor	Not supported
H_{19}: There is a positive relationship between the audit committee's financial expertise and audit fees.	Not supported
H_{20}: There is a negative relationship between the audit committee's financial expertise and NAS fees.	Not supported

Table 5.30 (continued)	
H_{21}: There is a positive relationship between the audit committee's financial expertise and the engagement of industry specialist auditor	Not supported
H_{22}: There is a positive relationship between the audit committee's meeting frequency and audit fees.	Not supported
H_{23}: There is a negative relationship between the audit committee's meeting frequency and NAS fees.	Not supported
H_{24}: There is a positive relationship between the audit committee's meeting frequency and the engagement of industry specialist auditor	Not supported

CHAPTER 6

FINDINGS AND DISCUSSIONS: THE EFFECTIVENESS OF THE BOARD OF DIRECTORS, AUDIT COMMITTEE, AUDIT QUALITY AND EARNINGS MANAGEMENT

6.1 Introduction

This chapter presents the results for the second empirical analysis: the relationships between the board of directors, audit committee and external auditor quality in constraining earnings management. Consistent with the previous chapter, the audit fees, NAS fees and industry specialist auditor variables represent the proxies for audit quality, while the board and audit committee variables are measured in term of their effectiveness characteristics (e.g. size, composition, financial expertise and meeting).

This chapter is organised as follows: next section presents the descriptive statistics, the univariate test and the correlation matrix. This is then followed by the research design, results and sensitivity analysis. The last section summarises this chapter.

6.2 Descriptive statistics and univariate test

This section reports the descriptive statistics and the results of the univariate test. Table 6.1 presents the descriptive statistics for all related variables used to examine the association between the board, audit committee, audit quality and earnings management for the sample of 613 firm-year observations. The present study highlights the descriptive statistics for earnings management, *MTBV*, *LOSS* and *CFO*, since the other variables have fairly similar means and standard deviations, as described in Chapter 5.1.

Across the three measures of *DACC*, the mean (median) of *DACCJM*, *DACCMJM* and *DACCROA* are relatively consistent, at 0.056 (0.037), 0.056 (0.037) and 0.059 (0.038), respectively. Yet a study conducted by Furgeson et al. (2004), which used the modified Jones model, found the mean and median absolute values of the sample firms' discretionary accruals over the period 1996 to 1998 to be 0.092 and 0.073, which is considerably higher than those documented in this study. This is probably due to the reforms initiated by the regulatory agency in promoting best practices in corporate behaviour. Such improvements, for example, can be seen from the Peasnell at al.' (2000) study that suggest that in the post-Cadbury period, earnings managements (e.g. income-increasing accruals to avoid losses or a decline in earnings) are smaller in firms whose board of directors has a higher proportion of non-executive directors. This is contrast to the pre-Cadbury period, during which there is no evidence suggest the composition of non-executive directors on board is associates to the earnings manipulation. They conclude that the publication of the Cadbury Report (1992) had a material impact on board monitoring function by helping firms to raise the standard of corporate behaviour, and especially the monitoring roles of the non-executive.

The mean (median) of *MTBV* and *CFO* are 3.066 (2.95) and 0.135 (0.110), respectively. Only 5.22% of the sample firms had two or more years of negative income *(LOSS).* Previous UK study by Peasnell et al. (2005) report the mean (median) of *CFO* in their sample was 0.116 (0.108), which is relatively consistent as documented in this study.

Table 6.2 presents the results of the mean difference tests for all variables in the earnings management model, according to the *DACC* measures. *DACC* found to be below the median are considered 'lower' earnings, whilst *DACC* above median are identified as 'higher' earnings. As can be seen in Table 6.2, the results of the t-tests for all variables under the *DACCJM* and *DACCMJM* models are fairly consistent. Most audit quality variables using these measures show significant mean differences between the two groups of earnings, including *LNAFEE, LNNAF, LNTOTALFEES, SPECLST_MSLEADER, SPECLST_PS* and *SPECLST_WEIGHTED*. However, under the *DACCROA* definition, the results of the t-tests suggest that only the variables *SPECLST_PS* and *SPECLST_WEIGHTED* indicate a significant difference between the lower and higher groups of earnings management.

For the board of director variables (under the *DACCJM* and *DACCMJM*), the results of the t-tests indicate that the *BRDNED* show a significant mean difference between the lower and higher groups of earnings. However, across the three *DACC* measures, there are no significant difference between these two groups of earnings for variables on *BDRSIZE, BRDEXP* and *BRDMEET.*

With respect to audit committee characteristics, the results for *ACSIZE* are conditional. Under the *DACCJM* definition, the results show that the mean audit committee size differs between the lower and higher groups of earnings, whilst when DACCMJM and *DACCROA* measures are used there is no significant difference. In addition, the t-test results for *ACIND* suggest that the means differ between the lower and higher groups of earnings across all measures of *DACC*. Among the control variables, the mean of *INOWN* is found to differ significantly between the higher and lower groups of earnings (under the *DACCJM* and *DACCMJM* measures). Other variables provide no evidence that their means are differ between the two groups of earnings.

Table 6.1: Descriptive statistics (*N*=613)							
Variables	Mean	Standard Deviation	First Quartile	Median	Third Quartile	Minimum	Maximum
DACCJM	0.056	0.072	0.018	0.037	0.069	0.000	0.851
DACCMJM	0.056	0.071	0.018	0.037	0.068	0.000	0.817
DACCROA	0.059	0.072	0.016	0.038	0.074	0.000	0.583
LNAFEE	2.897	0.434	2.587	2.903	3.176	1.845	4.176
LNNAF	2.677	0.726	2.307	2.752	3.113	0.000	4.398
LNTOTALFEES	3.170	0.447	2.845	3.159	3.477	2.068	4.477
FEERATIO1	0.421	0.204	0.278	0.400	0.555	0.000	0.918
FEERATIO2	1.111	1.354	0.385	0.667	1.250	0.000	11.113
SPECLST_MSLEADER	0.401	0.491	0.000	0.000	1.000	0.000	1.000
SPECLST_MS30	0.530	0.499	0.000	1.000	1.000	0.000	1.000
SPECLST_MS	0.342	0.208	0.199	0.321	0.426	0.015	0.902
SPECLST_PS	0.180	0.150	0.049	0.159	0.257	0.003	0.537
SPECLST_WEIGHTED	0.068	0.067	0.013	0.045	0.097	0.000	0.228
BRDSIZE	9.083	2.229	7.00	9.000	10.000	5.000	19.000
BRDNED	0.450	0.116	0.375	0.444	0.538	0.053	0.778
BRDEXP	0.353	0.141	0.250	0.333	0.444	0.083	0.8333
BRDMEET	8.672	2.626	7.000	8.000	10.000	3.000	21.000
ACSIZE	3.572	0.792	3.000	3.000	4.000	3.000	8.000

Table 6.1 (continued)

Variables	Mean	Standard Deviation	First Quartile	Median	Third Quartile	Minimum	Maximum
ACIND	0.718	0.450	0.000	1.000	1.000	0.000	1.000
ACEXP	0.390	0.206	0.000	0.333	0.500	0.000	2.000
ACMEET	3.974	1.206	3.000	4.000	4.000	2.000	10.000
INOWN	4.488	12.713	0.088	0.252	1.459	0.002	147.525
BLOCK	23.588	15.795	12.010	21.280	33.250	0.000	76.120
MTBV	3.066	24.718	1.940	2.95	4.45	-318.53	194.68
LOSS	0.052	0.222	0.000	0.000	0.000	0.000	1.000
CFO	0.135	0.105	0.072	0.110	0.174	-0.063	1.273
LEVERGN	0.645	0.218	0.513	0.645	0.758	0.056	2.055
LNASSET	6.143	0.526	5.766	6.105	6.449	4.516	7.706

DACCJM=discretionary accrual based on Jones Model, *DACCMJM*=discretionary accruals based on Modified Jones model*;* *DACCROA*=discretionary accruals by Kothari et al. (2005), including lagged ROA in the accrual regression to control for firm performance; *LNAFEE*= the natural log of audit fees; *LNNAF*=natural log of NAS fees; *LNTOTALFEES*=natural log of the sum of audit and NAS fees; *FEERATIO1*= the fee ratio of NAS fees to total fees; *FEERATIO2*= the fee ratio of NAS fees to audit fees; *SPECLST_MSLEADER*= coded as 1 if the auditor earned the largest market share in each particular industry, 0 if otherwise; *SPECLST_MS30*= coded as 1 if the auditor' market share exceed 30 percent in each particular industry, 0 if otherwise; *SPECLST_MS*= continuous variable which equals to the respective auditor' market share; *SPECLST_PS*= continuous variable which equals to the respective auditor' portfolio share; *SPECLST_WEIGHTED*= continuous variable which equals to the compliment between auditor' market share (*SPECLST_MS*) and portfolio share *(SPECLST_PS); BRDSIZE*=the numbers of board' members during the year; *BDRNED*=the proportion of non-executive directors on board to board size; *BRDEXP*=the proportion of directors with accounting experience and financial qualification to board size; *BRDMEET*= the number of board meetings during the year; *ACSIZE*= the number of audit committee members; *ACIND*= coded as 1 if audit committee had solely non-executive directors; 0 otherwise; *ACEXP*= the proportion of audit committee members with accounting experience and financial qualification to audit committee size; *ACMEET*= the number of audit committee meetings during the year; *INOWN*=the cumulative percentage of total shares owned by the directors of a firm; *BLOCK*= the cumulative percentage shares ownership of the blockholders who hold at least 5 percent or more of outstanding common shares and who are unaffiiliated with management; *MTBV*= market to book value ratio; *LOSS*= coded as 1 if the firm had two or more years of negative income, 0 otherwise; *CFO*=cash flow from operation scaled by lagged total asset; *LEVERGN*=proportion of debts to total assets; *LNASSET*= the natural logarithm of total assets;

Table 6.2: Univariate Tests															
DACC	*DACCJM*					*DACCMJM*					*DACCROA*				
	Mean		Std. Dev.		t-test	Mean		Std. Dev.		t-test	Mean		Std. Dev.		t-test
	lower	higher	lower	higher		lower	higher	lower	higher		lower	higher	lower	higher	
LNAFEE	2.857	2.936	0.435	0.429	-2.263**	2.857	2.937	0.432	0.433	-2.290**	2.878	2.915	0.455	0.411	-1.060
LNNAF	2.627	2.727	0.714	0.736	-1.720*	2.621	2.733	0.735	0.714	-1.912*	2.654	2.700	0.736	0.716	-0.776
LNTOTALFEES	3.123	3.216	0.452	0.438	-2.569**	3.127	3.212	0.447	0.444	-2.358**	3.152	3.188	0.466	0.428	-0.997
FEERATIO1	0.412	0.430	0.207	0.201	-1.131	0.415	0.427	0.211	0.197	-0.715	0.418	0.424	0.209	0.199	-0.344
FEERATIO2	1.076	1.147	1.330	1.378	-0.652	1.105	1.118	1.357	1.353	-0.115	1.133	1.089	1.437	1.267	0.408
SPECLST_ MSLEADER	0.359	0.443	0.481	0.498	-2.114**	0.366	0.436	0.483	0.497	-1.781*	0.389	0.414	0.488	0.493	-0.625
SPECLST_MS30	0.497	0.564	0.501	0.497	-1.658*	0.5000	0.560	0.501	0.497	-1.495	0.529	0.531	0.499	0.499	-0.038
SPECLST_MS	0.335	0.350	0.214	0.202	-0.872	0.338	0.347	0.213	0.203	-0.494	0.351	0.334	0.013	0.011	1.030
SPECLST_PS	0.150	0.211	0.131	0.161	-5.141***	0.155	0.205	0.133	0.160	-4.219***	0.158	0.203	0.130	0.164	-3.781***
SPECLST_ WEIGHTED	0.055	0.080	0.057	0.073	-4.857***	0.057	0.078	0.058	0.072	-3.996***	0.060	0.075	0.060	0.072	-2.851***
BRDSIZE	9.006	9.160	2.159	2.297	-0.850	9.049	9.117	2.173	2.287	-0.389	9.072	9.084	2.196	2.266	-0.125
BRDNED	0.438	0.463	0.113	0.117	-2.621***	0.440	0.461	0.115	0.116	-2.168**	0.449	0.452	0.116	0.116	-0.399
BRDEXP	0.348	0.358	0.135	0.147	-0.934	0.348	0.358	0.135	0.147	-0.886	0.347	0.358	0.133	0.149	-0.950
BRDMEET	8.578	8.765	2.609	2.644	-0.882	8.611	8.733	2.644	2.611	-0.574	8.618	8.726	2.569	2.686	-0.512
ACSIZE	3.513	3.632	0.702	0.870	-1.861*	3.546	3.599	0.764	0.820	-0.837	3.621	3.652	0.853	0.724	1.509
ACIND	0.673	0.762	0.470	0.426	-2.456**	0.676	0.759	0.469	0.428	-2.275**	0.686	0.749	0.465	0.434	-1.732*

Table 6.2 (continued)															
ACEXP	0.383	0.397	0.198	0.214	-0.853	0.382	0.399	0.197	0.215	-1.023	0.377	0.403	0.192	0.219	-1.535
ACMEET	3.938	4.010	1.214	1.198	-0.738	3.951	3.997	1.212	1.200	-0.470	3.899	4.049	1.153	1.253	-1.544
INOWN	5.621	3.359	15.300	9.347	2.209**	5.524	3.456	15.316	9.344	2.019**	5.063	3.916	14.475	10.667	1.117
BLOCK	23.687	23.489	15.962	15.652	0.1551	23.831	23.346	15.792	15.821	0.380	24.543	22.636	15.854	15.704	1.496
MTBV	2.163	3.967	30.504	17.113	-0.904	1.932	4.197	30.725	16.688	-1.134	3.028	3.105	31.438	15.389	-0.039
LOSS	0.918	0.977	0.274	0.150	3.302***	0.918	0.977	0.274	0.150	3.302**	0.915	0.980	0.279	0.139	3.675***
CFO	0.146	0.124	0.106	0.104	2.621***	0.147	0.123	0.106	0.104	2.774***	0.144	0.126	0.103	0.107	2.032**
LEVERGN	0.637	0.653	0.214	0.221	-0.908	0.634	0.654	0.212	0.224	-1.055	0.647	0.644	0.204	0.231	0.185
LNASSET	6.154	6.131	0.501	0.550	0.549	6.160	6.126	0.498	0.553	0.797	6.187	6.099	0.525	0.524	2.074**

DACCJM=discretionary accrual based on Jones Model, *DACCMJM*=discretionary accruals based on Modified Jones model*;* *DACCROA*=discretionary accruals by Kothari et al. (2005), including lagged ROA in the accrual regression to control for firm performance; *LNAFEE*= the natural log of audit fees; *LNNAF*=natural log of NAS fees; *LNTOTALFEES*=natural log of the sum of audit and NAS fees; *FEERATIO1*= the fee ratio of NAS fees to total fees; *FEERATIO2*= the fee ratio of NAS fees to audit fees; *SPECLST_MSLEADER*= coded as 1 if the auditor earned the largest market share in each particular industry, 0 if otherwise; *SPECLST_MS30*= coded as 1 if the auditor' market share exceed 30 percent in each particular industry, 0 if otherwise; *SPECLST_MS*= continuous variable which equals to the respective auditor' market share; *SPECLST_PS*= continuous variable which equals to the respective auditor' portfolio share; *SPECLST_WEIGHTED*= continuous variable which equals to the compliment between auditor' market share (*SPECLST_MS*) and portfolio share *(SPECLST_PS);* *BRDSIZE*=the numbers of board' members during the year; *BDRNED*=the proportion of non-executive directors on board to board size; *BRDEXP*=the proportion of directors with accounting experience and financial qualification to board size; *BRDMEET*= the number of board meetings during the year; *ACSIZE*= the number of audit committee members; *ACIND*= coded as 1 if audit committee had solely non-executive directors; 0 otherwise; *ACEXP*= the proportion of audit committee members with accounting experience and financial qualification to audit committee size; *ACMEET*= the number of audit committee meetings during the year; *INOWN*=the cumulative percentage of total shares owned by the directors of a firm; *BLOCK*= the cumulative percentage shares ownership of the blockholders who hold at least 5 percent or more of outstanding common shares and who are unaffiiliated with management; *MTBV*= market to book value ratio; *LOSS*= coded as 1 if the firm had two or more years of negative income, 0 otherwise; *CFO*=cash flow from operation scaled by lagged total asset; *LEVERGN*=proportion of debts to total assets; *LNASSET*= the natural logarithm of total assets; The sample populations for 'lower' is 306 firm-year observation, while for 'higher' is 307 firm-year observation; The significant level is based on two tailed tests, *** are significant at $p<0.01$, ** are significant at $p<0.05$ and *at $p<0.10$.

Table 6.3: Pairwise correlation matrix (*N*=613)

Variable		A	B	C	D	E	F	G	H	I	J	K
A	*DACCJM*	1.000										
B	*DACCMJM*	**0.986**	1.000									
C	*DACCROA*	**0.850**	**0.854**	1.000								
D	*LNAFEE*	-0.049	-0.042	-0.025	1.000							
E	*LNNAF*	0.014	0.006	0.001	**0.510**	1.000						
F	*LNTOTALFEES*	-0.028	-0.029	-0.015	**0.906**	**0.736**	1.000					
G	*FEERATIO1*	0.037	0.019	0.004	**-0.113**	**0.662**	**0.300**	1.000				
H	*FEERATIO2*	0.062	0.042	0.045	**-0.160**	**0.437**	**0.243**	**0.805**	1.000			
I	*SPECLST_MSLEADER*	-0.054	-0.047	0.000	**0.223**	*0.095*	0.205	-0.018	-0.039	1.000		
J	*SPECLST_MS30*	-0.061	-0.049	0.001	**0.279**	**0.139**	**0.246**	-0.037	<u>-0.075</u>	**0.771**	1.000	
K	*SPECLST_MS*	-0.017	-0.010	*0.082*	**0.261**	**0.137**	**0.251**	0.007	-0.018	**0.793**	**0.774**	1.000
L	*SPECLST_PS*	**-0.195**	**-0.191**	**-0.189**	**0.215**	<u>0.070</u>	**0.156**	**-0.117**	**-0.113**	**0.423**	**0.431**	**0.187**
M	*SPECLST_WEIGHTED*	**-0.172**	**-0.167**	**-0.108**	**0.248**	**0.119**	**0.207**	<u>-0.068</u>	*-0.080*	**0.679**	**0.653**	**0.534**
N	*BRDSIZE*	*0.092*	*0.097*	*0.094*	**0.423**	**0.270**	**0.423**	0.043	0.016	**0.243**	**0.204**	**0.260**
O	*BRDNED*	<u>-0.076</u>	*-0.080*	-0.027	**0.444**	**0.282**	**0.429**	0.016	-0.010	0.031	0.045	0.008
P	*BRDEXP*	-0.023	-0.027	-0.019	**-0.129**	*-0.090*	**-0.133**	-0.022	-0.010	**-0.179**	**-0.105**	**-0.137**
Q	*BRDMEET*	-0.009	-0.018	-0.015	-0.017	-0.017	-0.001	0.027	0.040	-0.031	-0.008	*-0.095*
R	*ACSIZE*	-0.035	-0.036	0.030	**0.361**	**0.161**	**0.329**	-0.034	-0.063	*0.102*	**0.107**	*0.099*
S	*ACIND*	*-0.090*	*-0.095*	-0.057	**0.132**	**0.109**	**0.125**	0.003	-0.018	0.033	*0.092*	0.039
T	*ACEXP*	0.035	0.039	0.010	-0.050	-0.029	-0.042	0.007	0.036	-0.051	0.021	-0.042

Table 6.3 (continued)												
Variable		A	B	C	D	E	F	G	H	I	J	K
U	*ACMEET*	0.029	0.025	0.007	**0.340**	**0.264**	**0.365**	*0.092*	<u>0.079</u>	0.007	-0.029	-0.007
V	*INOWN*	0.029	0.026	0.023	**-0.161**	-0.023	**-0.112**	<u>0.078</u>	**0.139**	-0.040	*-0.098*	<u>-0.078</u>
W	*BLOCK*	*0.083*	*0.086*	0.055	**-0.142**	-0.035	*-0.093*	<u>0.075</u>	**0.134**	-0.032	<u>-0.067</u>	-0.020
X	*MTBV*	0.042	0.046	0.003	-0.007	0.030	0.032	0.060	**0.111**	0.022	0.005	0.021
Y	*LOSS*	**0.231**	**0.247**	**0.317**	0.032	0.001	0.042	0.006	0.019	0.058	0.044	0.058
Z	*CFO*	*0.103*	*0.102*	0.042	**-0.179**	<u>-0.069</u>	**-0.168**	0.008	0.029	-0.010	-0.050	0.011
AA	*LEVERGN*	-0.062	-0.054	-0.035	**0.211**	*0.083*	**0.178**	-0.061	-0.054	0.057	**0.114**	*0.083*
AB	*LNASSET*	0.032	0.031	*0.082*	**0.700**	**0.415**	**0.686**	0.044	-0.021	**0.209**	**0.216**	**0.251**
		L	M	N	O	P	Q	R	S	T	U	V
L	*SPECLST_PS*	1.000										
M	*SPECLST_WEIGHTED*	**0.882**	1.000									
N	*BRDSIZE*	-0.047	*0.094*	1.000								
O	*BRDNED*	0.057	0.034	0.013	1.000							
P	*BRDEXP*	*0.083*	-0.030	**-0.343**	0.019	1.000						
Q	*BRDMEET*	*0.098*	0.034	**-0.134**	**0.146**	0.018	1.000					
R	*ACSIZE*	-0.062	-0.002	**0.398**	**0.339**	**-0.190**	0.013	1.000				
S	*ACIND*	**0.139**	*0.103*	-0.014	**0.480**	*0.085*	**0.130**	0.005	1.000			
T	*ACEXP*	*0.094*	0.044	-0.029	-0.027	**0.564**	-0.040	**-0.204**	**0.076**	1.000		
U	*ACMEET*	0.004	-0.005	**0.242**	**0.247**	-0.018	**0.228**	**0.156**	0.047	-0.020	1.000	
V	*INOWN*	-0.022	-0.039	-0.013	**-0.158**	-0.022	**-0.205**	*-0.087*	*-0.097*	0.008	**-0.132**	1.000

Table 6.3 (continued)												
Variable		L	M	N	O	P	Q	R	S	T	U	V
W	*BLOCK*	**-0.129**	**-0.109**	0.046	-0.077	0.006	*-0.083*	*-0.086*	-0.079	0.065	0.065	0.057
X	*MTBV*	0.037	0.054	0.029	0.004	0.027	-0.013	-0.040	0.027	0.001	0.059	0.010
Y	*LOSS*	0.054	0.044	0.028	0.045	0.037	*0.088*	-0.025	-0.049	0.004	*0.084*	0.054
Z	*CFO*	-0.032	-0.036	0.019	**-0.186**	-0.036	-0.060	-0.072	*-0.080*	0.026	-0.023	0.069
AA	*LEVERGN*	*0.099*	**0.114**	**0.115**	*0.098*	0.027	**0.172**	0.061	*0.093*	0.015	**0.119**	**-0.182**
AB	*LNASSET*	-0.039	*0.083*	**0.443**	**0.398**	**-0.192**	0.045	**0.361**	0.066	*-0.092*	0.356	**-0.146**
		W	*X*	Y	Z	AA	AB					
W	*BLOCK*	1.000										
X	*MTBV*	0.003	1.000									
Y	*LOSS*	0.051	0.070	1.000								
Z	*CFO*	**0.110**	*0.088*	**0.159**	1.000							
AA	*LEVERGN*	-0.070	-0.012	**-0.120**	0.078	1.000						
AB	*LNASSET*	**-0.189**	0.011	-0.045	**-0.254**	0.063	1.000					

DACCJM=discretionary accrual based on Jones Model, *DACCMJM*=discretionary accruals based on Modified Jones model*; DACCROA*=discretionary accruals by Kothari et al. (2005), including lagged ROA in the accrual regression to control for firm performance; *LNAFEE*= the natural log of audit fees; *LNNAF*=natural log of NAS fees; *LNTOTALFEES*=natural log of the sum of audit and NAS fees; *FEERATIO1*= the fee ratio of NAS fees to total fees; *FEERATIO2*= the fee ratio of NAS fees to audit fees; *SPECLST_MSLEADER*= coded as 1 if the auditor earned the largest market share in each particular industry, 0 if otherwise; *SPECLST_MS30*= coded as 1 if the auditor' market share exceed 30 percent in each particular industry, 0 if otherwise; *SPECLST_MS*= continuous variable which equals to the respective auditor' market share; *SPECLST_PS*= continuous variable which equals to the respective auditor' portfolio share; *SPECLST_WEIGHTED*= continuous variable which equals to the compliment between auditor' market share (*SPECLST_MS*) and portfolio share *(SPECLST_PS); BRDSIZE*=the numbers of board' members during the year; *BDRNED*=the proportion of non-executive directors on board to board size; *BRDEXP*=the proportion of directors with accounting experience and financial qualification to board size; *BRDMEET*= the number of board meetings during the year; *ACSIZE*= the number of audit committee members; *ACIND*= coded as 1 if audit committee had solely non-executive directors; 0 otherwise; *ACEXP*= the proportion of audit committee members with accounting experience and financial qualification to audit committee size; *ACMEET*= the number of audit committee meetings during the year; *INOWN*=the cumulative percentage of total shares owned by the directors of a firm; *BLOCK*= the cumulative percentage shares ownership of the blockholders who hold at least 5 percent or more of outstanding common shares and who are unaffiiliated with management; *MTBV*= market to book value ratio; *LOSS*= coded as 1 if the firm had two or more years of negative income, 0 otherwise; *CFO*=cash flow from operation scaled by lagged total asset; *LEVERGN*=proportion of debts to total assets; *LNASSET*= the natural logarithm of total assets; Correlation in **bold** are significant at p<0.01, in *italic* are significant at p<0.05 and underline at p<0.10.

6.3 Correlation matrix

The correlation matrix for all variables indicate in the earning management model is presented in Table 6.3. The higher correlations among discretionary accruals and audit quality measures are always expected since they are highly interrelated to each other. Among the audit quality proxies, the *SPECLST_PS* and *SPECLST_WEIGHTED* variables are significant and negatively correlated with all *DACC* measures at p<0.01, suggesting that the industry specialist auditors are effective in constraining opportunistic earnings. The range of the correlation coefficient is from -0.0167 to -0.195. None of the audit fees and NAS measures are significantly correlated with *DACC* However, with respect to the independence of the board of directors and audit committee, *BRDNED* and *ACIND* are significant and negatively correlated with *DACCJM* and *DACCMJM* (the correlation coefficients range from -0.035 to -0.080). Even though *BRDNED* and *ACIND* are insignificantly correlated with *DACCROA*, their signs of coefficient do indicate a negative relationship. This may suggest that the independent non-executive directors either on the board or the audit committee contribute to the oversight of the firm and are thus likely to constrain opportunistic earnings. The other board and audit committee characteristics are insignificantly correlated to all *DACC* measures.

6.4 Multivariate regression

The multivariate regressions are estimated using least square regression with robust standard error to control for heteroscedasticity. Table 6.4 presents the results based on the three measures of discretionary accruals: *DACCJM, DACCMJM* and *DACCROA.*[71] Since there is multiple variables surrogate for audit quality proxy and most of them are highly correlated with each other, each of them is included in a single empirical model. In total there are thirty models of earnings management examined. The F-statistic for all models is significant at p<0.01. The adjusted R^2 range is between 0.108 and 0.159, which is lower than that documented in a prior UK study conducted by Peasnell et al. (2005). This may be due to the sample size and different model specification.

[71] The multivariate regression was estimated only for the pooled sample, due to the insignificant F-statistic that is obtained when it is modeled in the year-by-year samples.

As can be seen from Table 6.4, *LNAFEE* is significant and negatively related to all *DACC* measures, suggesting that firms with higher audit fees are more likely to constrain earnings management. There is possibility that the firms with higher audit fees induce more audit effort, which in turn reduces the likelihood of opportunistic earnings. This result is consistent with the argument set forth by Caramis and Lennox (2008), who state that when audit hours are lower, firms report larger income-increasing discretionary accruals.

In all models, none of NAS fees measures are significantly related with *DACC*. This result is consistent with Chung and Kallapur (2003) and Ruddock et al. (2006), who find no evidence of a relationship between NAS and earnings management. Although there is no significant relationship, the results provide mix directional sign of the NAS coefficients and earnings management, suggesting the measures of auditor independent are sensitive to the research design.

The results for industry specialist auditors are conditional. The industry specialist auditors measured by the *SPECLST_PS* and *SPECLST_WEIGHTED* are significant and negatively related to earnings management across three measures of discretionary accruals (*DACCJM*, *DACCMJM* and *DACCROA*). However, using the market share approach to compute the variables of industry specialist auditors, it appears that none of these measures are significantly related with *DACC*. Krishnan (2001) notes that the portfolio approach is better at capturing auditors' efforts to differentiate their products from those of their competitors than the market share approach. These significant results may suggest that earnings management in firms with industry specialist auditors is lower than firms with non-specialist auditors. This is consistent with Krishnan (2003a), who suggests that the industry specialist auditors provide a higher quality audit than non-specialist auditors by mitigating accruals-based earnings.

In relation to the board of director and audit committee characteristics, none of these variables are significantly related with *DACC* except for *ACSIZE*, which is found to be negatively related with earnings management in the *DACCJM* and *DACCMJM* models for the pooled sample. Even though the relationship is weak (at $p<0.10$), these results are consistent with those found by Yang and Krishnan (2005). As compared to prior UK studies, the results are contradicted to Habbash (2010) and Habbash et al

(2010). The possible explanation on this contradictory may be due to the different research design. Habbash (2010) segregates the board and audit committee variables in two different earnings management model, while Habbash et al. (2010) do not control the audit committee variables in their earnings management model.

For the control variables, *INOWN* and *BLOCK* suggest insignificant relationship with *DACC*, and *MTBV* is negatively related with earnings management, particularly in the *DACCJ*M and *DACCMJM* models. This negative relationship contradicts the results reported by Klein (2002), but is relatively consistent with Bowen et al. (2008). All of the models indicate positive relationships between *LOSS* and *CFO* with *DACC*, suggesting that the firms with negative income and higher cash flow have greater incentive to manage reported earnings. The positive coefficient between *CFO* and *DACC* is consistent with Frankel et al. (2002). In addition, there is a negative relationship between *LEVERGN* and *DACC* in most of the *DACCJM* models (at $p<0.10$), but it is insignificantly related to the other *DACC* measures. The negative relationship between *LEVERGN* and *DACC* are consistent with prior studies (Klein, 2002; Bédard et al., 2004). *LNASSET* is significant and positively related with *DACC* in most models, consistent with Becker et al. (1998) and DeFond and Park (1997).

In summary, the results from the multivariate analyses indicate that the firms engaging the auditor industry specialist and paying higher audit fees are associated with lower earnings management. This is consistent with prior studies (e.g. Caramis and Lennox, 2008; Krishnan, 2003a) that suggest higher quality auditors have a greater ability to constrain earnings manipulation through the extent of their monitoring function, thus improving the quality of reported earnings. In addition, there is no significant relationship between NAS and earnings management, suggesting that joint provision of audit and NAS have no effect on opportunistic earnings. This result is contradicted to the prior study in the UK done by Antle at al. (2006) that suggests a negative relationship between NAS and earnings management. One of the possible reasons on this may be due to the increased of NAS studies and the reformation of the UK corporate governance system.

However, none of the results suggest that the board of director or audit committee characteristics can be clearly linked with earnings management. As previously noted by Larker and Richardson (2004), the monitoring role of auditors depends on the strength of a firms' corporate governance structure, and therefore it is possible that the auditor monitoring roles outweigh the oversight functions of boards and audit committees, and hence contribute to the insignificant results for corporate governance variables and earnings management.

Table 6.4: The results of multivariate regression for the earnings management model										
$DACC = \beta_0 + \beta_1 AQ + \beta_2 BRDSIZE + \beta_3 BRDNED + \beta_4 BRDEXP + \beta_5 BRDMEET + \beta_6 ACSIZE + \beta_7 ACIND + \beta_8 ACEXP + \beta_9 ACMEET + \beta_{10} INOWN + \beta_{11} BLOCK + \beta_{12} MTBV + \beta_{13} CFO + \beta_{14} LEVERGN + \beta_{15} LNASSET + \varepsilon$										
The dependent variable of ***DACC*** is measured as follows: (1) *DACCJM* ; (2) *DACCMJM;* and (3) *DACCROA* The ***AQ*** proxies are: *LNAFEE, LNNAF, LNTOTALFEES, FEERATIO1, FEERATIO2, SPECLST_MSLEADER, SPECLST_MS30, SPECLST_MS, SPECLST_PS* or *SPECLST_WEIGHTED*										
Variable	Coefficient *(t-statistics)*									
	(1) DACCJM									
Model	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
Intercept	0.061 *(1.41)*	0.071 *(1.63)*	0.066 *(1.52)*	0.069 *(1.61)*	0.069 *(1.61)*	0.064 *(1.49)*	0.064 *(1.48)*	0.068 *(1.57)*	0.085 *(1.98)*	0.070 *(1.64)*
LNAFEE	-0.019 *(-2.23)***									
LNNAF		0.001 *(0.24)*								
LNTOTALFEES			-0.014 *(-1.53)*							
FEERATIO1				0.007 *(0.48)*						
FEERATIO2					0.002 *(0.70)*					
SPECLST_ MSLEADER						-0.009 *(-1.51)*				
SPECLST_MS30							-0.008 *(-1.28)*			
SPECLST_MS								-0.009 *(-0.55)*		
SPECLST_PS									-0.078 *(-4.70)****	
SPECLST_ WEIGHTED										-0.167 *(-4.92)****

Table 6.4 (continued)										
BRDSIZE	0.004 (1.51)	0.003 (1.31)	0.004 (1.46)	0.003 (1.31)	0.003 (1.31)	0.004 (1.40)	0.004 (1.36)	0.003 (1.31)	0.003 (1.39)	0.004 (1.50)
BRDNED	0.005 (0.13)	-0.011 (-0.32)	0.001 (0.02)	-0.011 (-0.31)	-0.011 (-0.32)	-0.012 (-0.34)	-0.013 (-0.39)	-0.012 (-0.35)	-0.007 (-0.21)	-0.012 (-0.37)
BRDEXP	0.017 (0.61)	0.016 (0.57)	0.016 (0.58)	0.016 (0.58)	0.016 (0.61)	0.012 (0.44)	0.013 (0.49)	0.015 (0.56)	0.016 (0.60)	0.011 (0.42)
BRDMEET	0.000 (0.30)	0.001 (0.59)	0.000 (0.42)	0.001 (0.58)	0.001 (0.54)	0.001 (0.58)	0.001 (0.59)	0.001 (0.54)	0.001 (0.90)	0.001 (0.71)
ACSIZE	-0.007 (-1.43)	-0.007 (-1.50)	-0.007 (-1.51)	-0.007 (-1.48)	-0.007 (-1.43)	-0.007 (-1.50)	-0.007 (-1.47)	-0.007 (-1.49)	-0.008 (-1.68)*	-0.008 (-1.66)*
ACIND	-0.013 (-1.52)	-0.013 (-1.49)	-0.013 (-1.51)	-0.013 (-1.49)	-0.012 (-1.49)	-0.012 (-1.46)	-0.012 (-1.41)	-0.012 (-1.49)	-0.010 (1.23)	-0.010 (-1.26)
ACEXP	0.004 (0.26)	0.004 (0.27)	0.004 (0.28)	0.004 (0.26)	0.004 (0.23)	0.005 (0.30)	0.006 (0.37)	0.004 (0.26)	0.009 (0.53)	0.008 (0.49)
ACMEET	0.000 (0.02)	-0.001 (-0.22)	0.000 (0.04)	-0.001 (-0.24)	-0.001 (-0.30)	-0.001 (-0.33)	-0.001 (-0.37)	-0.000 (-0.26)	-0.001 (-0.26)	-0.001 (-0.46)
INOWN	0.000 (0.33)	0.000 (0.44)	0.000 (0.49)	0.000 (0.41)	0.000 (0.29)	0.000 (0.41)	0.000 (0.34)	0.000 (0.39)	0.000 (0.51)	0.000 (0.40)
BLOCK	0.000 (1.05)	0.000 (1.12)	0.000 (1.18)	0.000 (1.09)	0.000 (0.97)	0.000 (1.11)	0.000 (1.10)	0.000 (1.13)	0.000 (0.61)	0.000 (0.75)
MTBV	-0.000 (-2.01)**	-0.000 (-1.99)**	-0.000 (-1.59)*	-0.000 (-2.03)**	-0.000 (-2.11)**	-0.000 (-1.88)*	-0.000 (-1.92)*	-0.000 (-1.94)*	-0.000 (-1.71)*	-0.000 (-1.63)
LOSS	0.083 (4.47)***	0.084 (4.44)***	0.084 (4.45)***	0.084 (4.44)***	0.084 (4.43)***	0.083 (4.37)***	0.083 (4.37)***	0.083 (4.42)***	0.080 (4.30)***	0.081 (4.32)***
CFO	0.095 (2.47)**	0.095 (2.46)**	0.095 (2.48)**	0.095 (2.46)**	0.095 (2.47)**	0.096 (2.45)**	0.095 (2.44)**	0.096 (2.48)**	0.092 (2.34)**	0.093 (2.38)**
LEVERGN	-0.022 (-1.40)	-0.028 (-1.76)*	-0.025 (-1.55)	-0.028 (-1.74)*	-0.027 (-1.72)*	-0.027 (-1.72)*	-0.026 (-1.70)*	-0.027 (-1.77)*	-0.024 (-1.54)	-0.023 (-1.50)
LNASSET	0.018 (2.92)***	0.010 (1.54)	0.016 (2.29)**	0.010 (1.66)*	0.010 (1.70)*	0.011 (1.94)*	0.012 (1.95)*	0.011 (1.84)*	0.008 (1.41)	0.011 (1.90)*
Adj. R^2	0.113	0.108	0.111	0.108	0.109	0.111	0.110	0.108	0.132	0.130

Table 6.4 (continued)										
Variable	Coefficient *(t-statistics)*									
	(2) DACCMJM									
Model	(k)	(l)	(l)	(n)	(o)	(p)	(q)	(r)	(s)	(t)
Intercept	0.070 *(1.68)**	0.079 *(1.86)**	0.074 *(1.77)**	0.079 *(1.89)**	0.078 *(1.87)**	0.074 *(1.75)**	0.074 *(1.77)**	0.077 *(1.84)**	0.093 *(2.22)***	0.079 *(1.87)**
LNAFEE	-0.017 *(-1.99)***									
LNNAF		-0.000 *(-0.06)*								
LNTOTALFEES			-0.014 *(-1.63)*							
FEERATIO1				0.000 *(0.03)*						
FEERATIO2					0.001 *(0.43)*					
SPECLST_ MSLEADER						-0.008 *(-1.35)*				
SPECLST_MS30							-0.006 *(-0.99)*			
SPECLST_MS								-0.006 *(-0.40)*		
SPECLST_PS									-0.074 *(-4.65)****	
SPECLST_ WEIGHTED										-0.160 *(-4.83)****
BRDSIZE	0.004 *(1.50)*	0.003 *(1.34)*	0.004 *(1.48)*	0.003 *(1.34)*	0.003 *(1.33)*	0.004 *(1.41)*	0.003 *(1.37)*	0.003 *(1.32)*	0.003 *(1.40)*	0.004 *(1.51)*
BRDNED	0.004 (0.11)	-0.009 (-0.25)	0.002 (0.06)	-0.009 (-0.26)	-0.010 (-0.27)	-0.010 (-0.29)	-0.011 (-0.32)	-0.010 (-0.29)	-0.006 (-0.17)	-0.011 (-0.31)

Table 6.4 (continued)										
BRDEXP	0.012 *(0.47)*	0.011 *(0.44)*	0.012 *(0.45)*	0.011 *(0.44)*	0.012 *(0.46)*	0.008 *(0.31)*	0.009 *(0.36)*	0.011 *(0.42)*	0.012 *(0.46)*	0.007 *(0.28)*
BRDMEET	0.000 *(0.07)*	0.000 *(0.34)*	0.000 *(0.17)*	0.000 *(0.35)*	0.000 *(0.32)*	0.000 *(0.34)*	0.000 *(0.35)*	0.000 *(0.31)*	0.001 *(0.67)*	0.000 *(0.47)*
ACSIZE	-0.007 *(-1.48)*	-0.007 *(-1.55)*	-0.007 *(-1.55)*	-0.007 *(-1.54)*	-0.007 *(-1.50)*	-0.007 *(-1.54)*	-0.007 *(-1.52)*	-0.007 *(-1.54)*	-0.008 *(-1.71)**	-0.008 *(-1.69)**
ACIND	-0.014 *(-1.59)*	-0.013 *(-1.57)*	-0.014 *(-1.59)*	-0.013 *(-1.57)*	-0.013 *(-1.56)*	-0.013 *(-1.54)*	-0.013 *(-1.50)*	-0.013 *(-1.58)*	-0.011 *(-1.32)*	-0.011 *(-1.35)*
ACEXP	0.007 *(0.46)*	0.007 *(0.47)*	0.007 *(0.48)*	0.007 *(0.47)*	0.007 *(0.45)*	0.008 *(0.50)*	0.008 *(0.55)*	0.007 *(0.47)*	0.011 *(0.73)*	0.011 *(0.69)*
ACMEET	-0.000 *(-0.11)*	-0.001 *(-0.29)*	-0.000 *(-0.05)*	-0.001 *(-0.31)*	-0.001 *(-0.36)*	-0.001 *(-0.42)*	-0.001 *(-0.44)*	-0.001 *(-0.35)*	-0.001 *(-0.36)*	-0.001 *(-0.57)*
INOWN	0.000 *(0.26)*	0.000 *(0.38)*	0.000 *(0.42)*	0.000 *(0.37)*	0.000 *(0.29)*	0.000 *(0.33)*	0.000 *(0.28)*	0.000 *(0.32)*	0.000 *(0.43)*	0.000 *(0.32)*
BLOCK	0.000 *(1.07)*	0.000 *(1.14)*	0.000 *(1.19)*	0.000 *(1.13)*	0.000 *(1.04)*	0.000 *(1.12)*	0.000 *(1.11)*	0.000 *(1.13)*	0.000 *(0.62)*	0.000 *(0.76)*
MTBV	-0.000 *(-2.11)***	-0.000 *(-2.09)***	-0.000 *(-2.00)***	-0.000 *(-2.09)***	-0.000 *(-2.14)***	-0.000 *(-2.01)***	-0.000 *(-2.05)***	-0.000 *(-2.06)****	-0.000 *(-1.82)**	-0.000 *(-1.76)**
LOSS	0.087 *(4.45)****	0.088 *(4.43)****	0.088 *(4.44)****	0.088 *(4.43)****	0.088 *(4.42)****	0.087 *(4.36)****	0.087 *(4.37)****	0.088 *(4.42)****	0.085 *(4.30)****	0.085 *(4.31)****
CFO	0.094 *(2.57)***	0.095 *(2.57)***	0.094 *(2.58)***	0.094 *(2.57)***	0.095 *(2.57)***	0.095 *(2.56)***	0.094 *(2.54)***	0.095 *(2.59)***	0.091 *(2.45)***	0.092 *(2.48)***
LEVERGN	-0.020 *(-1.28)*	-0.025 *(-1.60)*	-0.022 *(-1.39)*	-0.025 *(-1.61)*	-0.025 *(-1.58)*	-0.024 *(-1.57)*	-0.024 *(-1.56)*	-0.024 *(-1.62)*	-0.021 *(-1.38)*	-0.020 *(-1.34)*
LNASSET	0.017 *(2.76)****	0.010 *(1.65)**	0.016 *(2.45)***	0.010 *(1.69)**	0.010 *(1.72)**	0.011 *(1.94)**	0.011 *(1.92)**	0.010 *(1.84)**	0.008 *(1.44)*	0.011 *(1.92)**
Adj. R^2	0.121	0.117	0.120	0.117	0.117	0.119	0.118	0.117	0.140	0.138

Table 6.4 (continued)										
Variable	Coefficient *(t-statistics)*									
	(3) DACCROA									
Model	(u)	(v)	(w)	(x)	(y)	(z)	(aa)	(ab)	(ac)	(ad)
Intercept	0.050 *(1.01)*	0.061 *(1.23)*	0.056 *(1.13)*	0.064 *(1.32)*	0.062 *(1.27)*	0.063 *(1.29)*	0.064 *(1.30)*	0.072 *(1.50)*	0.077 *(1.59)*	0.063 *(1.29)*
LNAFEE	-0.025 *(-2.54)***									
LNNAF		-0.003 *(-0.76)*								
LNTOTALFEES			-0.022 *(-1.28)*							
FEERATIO1				-0.004 *(-0.26)*						
FEERATIO2					0.002 *(0.55)*					
SPECLST_ MSLEADER						-0.000 *(-0.09)*				
SPECLST_MS30							-0.001 *(-0.11)*			
SPECLST_MS								0.028 *(1.56)*		
SPECLST_PS									-0.074 *(-4.63)****	
SPECLST_ WEIGHTED										-0.100 *(- 2.64)****
BRDSIZE	0.003 (1.37)	0.003 (1.11)	0.003 (1.35)	0.002 (1.07)	0.002 (1.06)	0.002 (1.05)	0.002 (1.05)	0.002 (0.89)	0.003 (1.13)	0.003 (1.18)
BRDNED	0.011 (0.28)	-0.006 (-0.15)	0.009 (0.23)	-0.008 (-0.22)	-0.009 (-0.24)	-0.009 (-0.23)	-0.008 (-0.22)	-0.003 (-0.09)	-0.005 (-0.14)	-0.098 (-0.26)

Table 6.4 (continued)										
BRDEXP	0.031 *(1.24)*	0.029 *(1.18)*	0.030 *(1.20)*	0.029 *(1.18)*	0.030 *(1.22)*	*0.029* *(1.19)*	0.029 *(1.20)*	0.031 *(1.28)*	0.030 *(1.22)*	0.026 *(1.08)*
BRDMEET	-0.000 *(-0.22)*	0.000 *(0.11)*	-0.000 *(-0.08)*	0.000 *(0.17)*	0.000 *(0.11)*	0.000 *(0.16)*	0.000 *(0.16)*	0.000 *(0.32)*	0.000 *(0.45)*	0.000 *(0.22)*
ACSIZE	-0.001 *(-0.13)*	-0.001 *(-0.24)*	-0.001 *(-0.21)*	-0.001 *(-0.22)*	-0.001 *(-0.18)*	-0.001 *(-0.21)*	-0.001 *(-0.21)*	-0.001 *(-0.19)*	-0.002 *(-0.36)*	-0.001 *(-0.29)*
ACIND	-0.009 *(-1.15)*	-0.009 *(-1.10)*	-0.009 *(-1.14)*	-0.009 *(-1.11)*	-0.009 *(-1.10)*	-0.009 *(-1.11)*	-0.009 *(-1.11)*	-0.010 *(-1.26)*	-0.007 *(-0.83)*	-0.008 *(-0.95)*
ACEXP	-0.005 *(-0.30)*	-0.005 *(-0.31)*	-0.005 *(-0.28)*	-0.005 *(-0.30)*	-0.005 *(-0.33)*	-0.005 *(-0.30)*	-0.005 *(-0.31)*	-0.005 *(-0.30)*	-0.001 *(-0.05)*	-0.003 *(-0.16)*
ACMEET	-0.003 *(-1.14)*	-0.003 *(-1.32)*	-0.003 *(-0.03)*	-0.003 *(-1.39)*	-0.004 *(-1.47)*	-0.004 *(-1.40)*	-0.004 *(-1.37)*	-0.003 *(-1.19)*	-0.004 *(-1.48)*	-0.004 *(-1.58)*
INOWN	0.000 *(0.59)*	0.000 *(0.79)*	0.000 *(0.82)*	0.000 *(0.78)*	0.000 *(0.62)*	0.000 *(0.74)*	0.000 *(0.75)*	0.000 *(0.90)*	0.000 *(0.82)*	0.000 *(0.72)*
BLOCK	0.000 *(0.64)*	0.000 *(0.77)*	0.000 *(0.83)*	0.000 *(0.77)*	0.000 *(0.63)*	0.000 *(0.74)*	0.000 *(0.75)*	0.000 *(0.72)*	0.000 *(0.21)*	0.000 *(0.50)*
MTBV	0.000 *(0.57)*	0.000 *(0.70)*	0.000 *(0.76)*	0.000 *(072)*	0.000 *(0.58)*	0.000 *(0.70)*	0.000 *(0.69)*	0.000 *(0.62)*	0.000 *(1.02)*	0.000 *(0.94)*
LOSS	0.110 *(5.74)****	0.111 *(5.60)****	0.111 *(5.76)****	0.111 *(5.61)****	0.111 *(5.59)****	0.111 *(5.61)****	0.111 *(5.63)****	0.113 *(5.69)****	0.108 *(5.53)****	0.109 *(5.55)****
CFO	0.073 *(2.00)***	0.073 *(2.02)***	0.073 *(2.01)***	0.073 *(2.01)***	0.073 *(2.01)***	0.073 *(2.01)***	0.073 *(2.01)***	0.070 *(2.01)***	0.069 *(1.90)**	0.071 *(1.96)**
LEVERGN	-0.014 *(-1.04)*	-0.021 *(-1.55)*	-0.016 *(-1.21)*	-0.022 *(-1.59)*	-0.021 *(-1.55)*	-0.021 *(-1.57)*	-0.022 *(-1.59)*	-0.024 *(-1.64)*	-0.017 *(-1.31)*	-0.019 *(-1.39)*
LNASSET	0.027 *(3.56)****	0.017 *(2.51)***	0.025 *(3.21)****	0.016 *(2.44)***	0.016 *(2.47)***	0.016 *(2.48)***	0.016 *(2.42)***	0.013 *(2.03)***	0.014 *(2.22)***	0.017 *(2.56)***
Adj. R^2	0.146	0.137	0.145	0.137	0.137	0.137	0.137	0.142	0.159	0.145
*** are significant at *p*<0.01, ** are significant at *p*<0.05 and *at *p*<0.10.										

6.6 The additional analyses and robustness tests

This section details the additional analyses that were carried out in order to see whether the primary findings are robust in the various model specifications. The tests include the heteroscedasticity and multicollinearity checks, various regression estimators, alternative definitions of the board and audit committee variables, the endogeneity test and 2SLS regressions.

6.6.1 Heteroscedasticity and multicollinearity checks

The results of the heteroscedasticity tests are presented in Table 6.5, according to the models indicated in Table 6.4. Based on the Breusch-Pagan or Cook-Weisberg tests, all models indicate a significant *p*-value, suggesting the presence of heteroscedasticity

The VIF and tolerance values are reported in Table 6.6. All models suggest that the VIF values are between 1.00 to 2.50, and none of the variables have a VIF value of more than 10 or a tolerance value of lower than 0.10.[72] This suggests that there is no multicollinearity problem.

6.6.2 Different regression estimators

Due to the heteroscedasticity problem, the main analyses were regressed using the least square regression with robust standard error. This section provides the results of the multivariate regression analysis using GLS regression, which is also efficient in controlling for heteroscedasticity and autocorrelation, as benchmark for comparison. The results are presented in Table 6.7. As can be seen, the results of the GLS regression analysis are relatively consistent with the main findings.

In addition to GLS estimator, the earnings management model is also been estimated using fixed-effect or random-effect estimators to control for time-invariant unobserved heterogeneity in the pooled sample. The Hausman specification test was used to show which estimator was more appropriate. Whilst the fixed-effect estimator always provides consistent results, it might not be the most efficient; the random-effect estimator, on the other hand, is a more efficient estimator and therefore

[72] Since there are 30 models of earnings management examined in the main analysis, the results of the VIF tests are reported for the selected models. However, all models suggest a relatively similar VIF value, which is between 1.00 to 3.00.

provides a better *p*-value. The null hypothesis of the Hausman test is that the preferred estimator is the random-effects. If the chi-square is more than 0.05, reject the null hypothesis that the random effect is preferable than fixed effect estimator. The results of the Hausman test are presented in Table 6.8. As can be seen in Table 6.8, model (a), (b), (c), (k), (l), (m), (u), (v) and (w) indicate chi-square more than 0.05, and thus the random-effect estimator is more appropriate. The other models were regressed using the fixed-effect estimator.

Table 6.9 presents the results of the preferred estimator according to the Hausman test. The results for the variables *LNAFEE*, *SPECLST_PS,* and *SPECLST_WEIGHTED* are significant and negatively related with *DACC* in all models. In addition, *SPECLST_MSLEADER* appears to have a negative relationship with earnings management across all models. The other variables are relatively unchanged, except *ACSIZE*, *INOWN*, *MTBV* and *CFO*, which are found to be contradictory to the main findings. *ACSIZE* is no longer significant, as indicated in models (i) and (j), while *INOWN* is significant and positively related with *DACC* in most of the fixed effect models. *MTBV* is significant and positively related with *DACC* in most models, while *CFO* is only significant when the models are estimated using the random-effect estimator. In summary, the audit fees and industry specialist auditor variables appear to be reasonably consistent and robust across the different estimators.

6.6.3 New definitions for board and audit committee variables

In order to check whether the results are robust to the new variable definitions, as in the previous chapter, the present study provides alternative definitions for the board and audit committee variables. Following Abbott et al. (2003a) and DeFond et al. (2005), these variables are:

(1) *BRDSIZE1* - coded as 1 if the firm's board size is less than the sample median, and 0 if otherwise;

(2) *BRDNED1* - coded as 1 if 60% of the firm's directors are independent, and 0 if otherwise;

(3) *ACIND1* - defined as the proportion of independent non-executive directors on the audit committee;

(4) *ACEXP1* - coded as 1 if the audit committee has at least one director equipped with financial expertise, and 0 if otherwise; and

(5) *ACMEET1* - coded as 1 if the audit committee meetings frequency is more than the sample median, and 0 if otherwise.

The other variables remain unchanged. Table 6.9 presents the results on the selected models.[73]

As can be seen in Table 6.10, the results for the alternative definitions are relatively consistent with the main findings except for *ACIND1,* which is found to be negatively related across all the *DACC* measures in all the models. Furthermore, in contrast to the primary findings, *LEVERGN* is insignificant with *DACCJM,* while *LNASSET* is significant and positively related with *DACCJM* in Model (i). Likewise, the *BRDSIZE1*, *BRDNED1*, *BRDMEET*, *ACEXP1* and *ACMEET* variables are all insignificant across all *DACC* measures. The other results are relatively unchanged, as documented in the primary findings.

The negative relationship between *ACIND* and *DACC* suggests that firms with whose audit committees with a higher proportion of independent non-executive directors are likely to be associated with reduced earnings management - this is not the case, however, for audit committees consisting solely of independent members. This may indicate the importance of the role of executive members and of their contribution to an effective audit committee. Overall, the results obtained for industry specialist auditor variables hold for the selected models.

6.6.4 <u>Endogeneity and two-stage least squares (2SLS) regression</u>

The main results suggest that the levels of earnings management reduced when firms hire industry specialist auditors, this is consistent with the argument that industry specialist auditors use their industry skills and competence to constrain opportunistic earnings. However, it can be argued that since the non-executive directors (e.g. outsiders) have difficulty to differentiating discretionary and non-discretionary accruals, it is possible that firms will choose industry specialist auditor to signal the

[73] All of the models are regressed using least square regression with robust standard error.

earnings management are constrained by the presence of a higher quality auditor and not necessarily because of their skills and competence (Francis et al., 1999 in Becker et al., 1998).

In addition, Caramanis and Lennox (2008) argue firms which had attention to manage earnings would have an incentive to contract for lower auditor effort (i.e. audit fees), which suggests a negative relationship between audit fees and earnings management. Moreover, the prior literature suggests that corporate governance characteristics are associated with endogeneity. Thus, taking into consideration all these possibilities, the present study tests whether the earnings management models contain these variables indicate in the main analysis are subject to endogeneity problem.

The Durbin-Wu-Hausman test is been performed on the selected models. The results are presented in Table 6.11. The null hypotheses are that *LNAFEE*, *SPECLST_PS*, *SPECLST_WEIGHTED*, *BRDSIZE*, *BDRNED*, *BRDMEET*, *BRDEXP*, *ACSIZE*, *ACIND1*, *ACMEET* and *ACEXP BDRSIZE* and *BRDNED* are exogeneous.[74]If the F-statistic were significant, then the null hypothesis would be rejected, suggesting that the presence of endogeneity. As can be seen, the *p*-values of *LNAFEE* (in models 'a' and 'k'), *BRDMEET* (in model 'u' and 'ad') and *ACEXP* (in models 'i', 'j' and 'ac') indicate significant F-statistic, suggesting that these variables are exogenous.

In order to mitigate the potential endogeneity in the models contained these variables, the 2SLS regressions are further regressed on the selected models. Table 6.12 presents the results of the 2SLS regressions. As can be seen, the *LNAFEE*, *SPECLST_PS*, *SPECLST_WEIGHTED* are significant and negatively related with *DACC* in all models. *BRDSIZE* and *ACEXP* are positively related with *DAC*C at $p<0.10$, suggesting a weak relationship with earnings management. *ACIND* and *LEVERGN* are no longer significant under the *DACCJM* and *DACCMJM* models, and the other variables are relatively unchanged. Likely, the results for audit fees and industry

[S] As with the first empirical investigation, the IV variables for corporate governance and audit fees are the lagged values, while the IV for the industry specialist auditor is the residual value from the first regression of *SPEC_AUD*, consistent with Velury et al. (2003). Similar procedures are applied to all the IV variables to ensure that they are valid (refer footnote 55).

specialist auditors *SPECLST_PS* and *SPECLST_WEIGHTED*) are consistent with the main findings, suggesting that the main results are robust to endogeneity.

Table 6.5: Heteroscedasticity test for earnings management model				
Breusch-Pagan or Cook-Weisberg Test				
H_0 = The variance of the residuals is constant Reject H_0 if p-value is significant				
DACC=	$\beta_0 + \beta_1 AQ + \beta_2 BRDSIZE + \beta_3 BRDNED + \beta_4 BRDEXP + \beta_5 BRDMEET + \beta_6 ACSIZE + \beta_7 ACIND + \beta_8 ACEXP + \beta_9 ACMEET + \beta_{10} INOWN + \beta_{11} BLOCK + \beta_{12} MTBV + \beta_{13} CFO + \beta_{14} LEVERGN + \beta_{15} LNASSET + \varepsilon$			
Model	Dependent variable (*DACC)*	Audit quality proxy *(AQ)*	chi2(1)	Prob > chi2
a	*DACCJM*	*LNAFEE*	217.78	0.000
b	*DACCJM*	*LNNAF*	221.14	0.000
c	*DACCJM*	*LNTOTALFEES*	205.23	0.000
d	*DACCJM*	*FEERATIO1*	226.24	0.000
e	*DACCJM*	*FEERATIO2*	230.69	0.000
f	*DACCJM*	*SPECLST_MSLEADER*	231.21	0.000
g	*DACCJM*	*SPECLST_MS30*	241.32	0.000
h	*DACCJM*	*SPECLST_MS*	224.57	0.000
i	*DACCJM*	*SPECLST_PS*	318.99	0.000
j	*DACCJM*	*SPECLST_WEIGHTED*	301.86	0.000
k	*DACCMJM*	*LNAFEE*	231.75	0.000
l	*DACCMJM*	*LNNAF*	236.76	0.000
m	*DACCMJM*	*LNTOTALFEES*	224.53	0.000
n	*DACCMJM*	*FEERATIO1*	237.53	0.000
o	*DACCMJM*	*FEERATIO2*	239.95	0.000
p	*DACCMJM*	*SPECLST_MSLEADER*	247.12	0.000
q	*DACCMJM*	*SPECLST_MS30*	251.82	0.000
r	*DACCMJM*	*SPECLST_MS*	240.79	0.000
s	*DACCMJM*	*SPECLST_PS*	328.35	0.000
t	*DACCMJM*	*SPECLST_WEIGHTED*	312.79	0.000
u	*DACCROA*	*LNAFEE*	116.72	0.000
v	*DACCROA*	*LNNAF*	117.12	0.000
w	*DACCROA*	*LNTOTALFEES*	111.62	0.000
x	*DACCROA*	*FEERATIO1*	118.91	0.000
y	*DACCROA*	*FEERATIO2*	124.08	0.000
z	*DACCROA*	*SPECLST_MSLEADER*	119.47	0.000
aa	*DACCROA*	*SPECLST_MS30*	119.50	0.000
ab	*DACCROA*	*SPECLST_MS*	131.70	0.000
ac	*DACCROA*	*SPECLST_PS*	174.19	0.000
ad	*DACCROA*	*SPECLST_WEIGHTED*	140.92	0.000

Table 6.6: VIF and tolerance values for earnings management model

Model	(a)		(b)		(c)		(d)		(f)		(h)		(i)		(j)	
Variable	VIF	Tolerance	VIF	Tolerance	VIF	Tolerance	VIF	Tolerance	VIF	Tolerance	VIF	Tolerance	VIF	Tolerance	VIF	Tolerance
LNAFEE	2.39	0.419														
LNNAF			1.29	0.774												
LNTOTALFEES					2.23	0.448										
FEERATIO1							1.04	0.965								
SPECLST_ MSLEADER									1.11	0.901						
SPECLST_MS											1.16	0.865				
SPECLST_PS													1.07	0.935		
SPECLST_ WEIGHTED															1.06	0.944
BRDSIZE	1.99	0.503	1.95	0.512	1.99	0.504	1.94	0.509	1.96	0.510	1.98	0.506	1.94	0.517	1.94	0.515
BRDNED	2.07	0.483	2.00	0.500	2.06	0.485	1.96	0.509	1.96	0.509	1.98	0.506	1.96	0.509	1.96	0.509
BRDEXP	1.80	0.555	1.80	0.555	1.80	0.555	1.80	0.555	1.82	0.550	1.80	0.554	1.80	0.555	1.80	0.554
BRDMEET	1.21	0.829	1.19	0.842	1.19	0.837	1.19	0.844	1.18	0.845	1.19	0.840	1.19	0.841	1.18	0.844
ACSIZE	1.52	0.656	1.53	0.655	1.52	0.657	1.53	0.655	1.52	0.657	1.52	0.657	1.53	0.656	1.52	0.656
ACIND	1.43	0.698	1.43	0.697	1.43	0.697	1.43	0.698	1.44	0.696	1.44	0.693	1.44	0.693	1.44	0.693
ACEXP	1.63	0.614	1.63	0.614	1.63	0.614	1.63	0.614	1.63	0.613	1.63	0.614	1.64	0.611	1.63	0.611
ACMEET	1.32	0.760	1.32	0.757	1.33	0.753	1.31	0.763	1.31	0.762	1.32	0.760	1.30	0.767	1.31	0.765
INOWN	1.10	0.907	1.10	0.906	1.10	0.909	1.11	0.903	1.10	0.908	1.11	0.905	1.10	0.909	1.10	0.909
BLOCK	1.10	0.908	1.10	0.908	1.10	0.909	1.11	0.904	1.10	0.909	1.10	0.909	1.12	0.895	1.11	0.901
MTBV	1.02	0.976	1.02	0.977	1.02	0.977	1.03	0.975	1.02	0.977	1.02	0.977	1.02	0.976	1.03	0.975
LOSS	1.06	0.939	1.07	0.939	1.06	0.940	1.06	0.940	1.07	0.935	1.07	0.936	1.07	0.936	1.07	0.937
CFO	1.16	0.865	1.16	0.865	1.06	0.940	1.16	0.865	1.16	0.865	1.16	0.863	1.16	0.865	1.16	0.865
LEVERGN	1.16	0.863	1.11	0.899	1.14	0.878	1.11	0.898	1.11	0.899	1.12	0.896	1.12	0.896	1.12	0.894
LNASSET	2.48	0.404	1.97	0.507	2.42	0.413	1.86	0.537	1.89	0.529	1.94	0.516	1.87	0.536	1.86	0.537
Mean VIF	1.53		1.42		1.51		1.39		1.40		1.41		1.39		1.39	

Table 6.7: The results of GLS regression for the earnings management model (*N*=613)										
Variable	Coefficient *(t-statistics)*									
	(1) DACCJM									
Model	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
Intercept	-0.026 *(-0.66)*	-0.017 *(-0.42)*	-0.021 *(-0.54)*	-0.019 *(-0.50)*	-0.019 *(-0.49)*	-0.022 *(-0.56)*	-0.022 *(-0.57)*	-0.019 *(-0.49)*	0.001 *(0.02)*	-0.014 *(-0.38)*
LNAFEE	-0.019 *(-2.10)***									
LNNAF		0.001 *(0.29)*								
LNTOTALFEES			-0.012 *(-1.36)*							
FEERATIO1				0.007 *(0.52)*						
FEERATIO2					0.003 *(0.80)*					
SPECLST_ MSLEADER						-0.009 *(-1.51)*				
SPECLST_MS30							-0.008 *(-1.26)*			
SPECLST_MS								-0.007 *(-0.46)*		
SPECLST_PS									-0.078 *(-4.65)****	
SPECLST_ WEIGHTED										-0.167 *(-4.89)****
BRDSIZE	0.004 *(1.42)*	0.003 *(1.22)*	0.003 *(1.36)*	0.003 *(1.23)*	0.003 *(1.23)*	0.003 *(1.32)*	0.003 *(1.28)*	0.003 *(1.23)*	0.003 *(1.31)*	0.004 *(1.42)*

Table 6.7 (continued)										
BRDNED	-0.000 (-0.00)	-0.016 (-0.45)	-0.005 (-0.13)	-0.015 (-0.44)	-0.016 (-0.45)	-0.016 (-0.47)	-0.018 (-0.52)	-0.016 (-0.48)	-0.011 (-0.33)	-0.017 (-0.49)
BRDEXP	0.013 *(0.49)*	0.013 *(0.47)*	0.013 *(0.47)*	0.013 *(0.47)*	0.014 *(0.51)*	0.009 *(0.33)*	0.010 *(0.38)*	0.012 *(0.45)*	0.014 *(0.50)*	0.008 *(0.31)*
BRDMEET	0.000 *(0.38)*	0.001 *(0.65)*	0.001 *(0.50)*	0.001 *(0.63)*	0.001 *(0.59)*	0.001 *(0.64)*	0.001 *(0.64)*	0.001 *(0.61)*	0.001 *(0.97)*	0.001 *(0.79)*
ACSIZE	-0.007 *(-1.51)*	-0.007 *(-1.56)*	-0.007 *(-1.58)*	-0.007 *(-1.54)*	-0.007 *(-1.49)*	-0.007 *(-1.58)*	-0.007 *(-1.55)*	-0.007 *(-1.57)*	-0.008 *(-1.74)**	-0.008 *(-1.73)**
ACIND	-0.013 *(-1.47)*	-0.013 *(-1.45)*	-0.013 *(-1.46)*	-0.013 *(-1.45)*	-0.012 *(-1.44)*	-0.012 *(-1.41)*	-0.012 *(-1.37)*	-0.012 *(-1.45)*	-0.010 *(-1.18)*	-0.010 *(-1.22)*
ACEXP	0.004 *(0.27)*	0.004 *(0.27)*	0.004 *(0.28)*	0.004 *(0.27)*	0.003 *(0.22)*	0.005 *(0.32)*	0.006 *(0.38)*	0.004 *(0.27)*	0.009 *(0.55)*	0.009 *(0.54)*
ACMEET	-0.000 *(-0.06)*	-0.001 *(-0.31)*	-0.000 *(-0.06)*	-0.001 *(-0.33)*	-0.001 *(-0.41)*	-0.001 *(-0.40)*	-0.001 *(-0.45)*	-0.000 *(-0.33)*	-0.001 *(-0.35)*	-0.001 *(-0.55)*
INOWN	0.000 *(0.37)*	0.000 *(0.48)*	0.000 *(0.52)*	0.000 *(0.44)*	0.000 *(0.29)*	0.000 *(0.45)*	0.000 *(0.38)*	0.000 *(0.44)*	0.000 *(0.55)*	0.000 *(0.45)*
BLOCK	0.000 *(1.06)*	0.000 *(1.13)*	0.000 *(1.18)*	0.000 *(1.09)*	0.000 *(0.96)*	0.000 *(1.12)*	0.000 *(1.10)*	0.000 *(1.13)*	0.000 *(0.60)*	0.000 *(0.75)*
MTBV	-0.000 *(-2.00)***	-0.000 *(-1.99)***	-0.000 *(-1.89)**	-0.000 *(-2.04)***	-0.000 *(-2.14)***	-0.000 *(-1.87)**	-0.000 *(-1.91)**	-0.000 *(-1.94)**	-0.000 *(-1.72)**	-0.000 *(-1.64)*
LOSS	0.081 *(4.43)****	0.082 *(4.41)****	0.082 *(4.41)****	0.082 *(4.41)****	0.082 *(4.40)****	0.080 *(4.33)****	0.081 *(4.32)****	0.081 *(4.39)****	0.078 *(4.25)****	0.079 *(4.28)****
CFO	0.085 *(2.13)***	0.084 *(2.12)***	0.084 *(2.14)***	0.085 *(2.11)***	0.085 *(2.13)***	0.085 *(2.11)***	0.084 *(2.10)***	0.085 *(2.13)***	0.081 *(1.99)***	0.082 *(2.03)***
LEVERGN	-0.023 *(-1.42)*	-0.028 *(-1.78)**	-0.025 *(-1.59)*	-0.028 *(-1.75)**	-0.028 *(-1.73)**	-0.027 *(-1.75)**	-0.027 *(-1.72)**	-0.028 *(-1.79)**	-0.025 *(-1.60)*	-0.024 *(-1.56)*
LNASSET	0.020 *(3.17)****	0.011 *(1.80)**	0.017 *(2.43)***	0.012 *(1.93)**	0.012 *(2.00)***	0.013 *(2.21)***	0.013 *(2.22)***	0.013 *(2.08)***	0.010 *(1.70)*	0.013 *(1.17)***
Adj. R^2	0.108	0.103	0.105	0.103	0.105	0.106	0.105	0.103	0.127	0.125

Table 6.7 (continued)										
Variable	Coefficient *(t-statistics)*									
	(2) DACCMJM									
Model	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)	(t)
Intercept	-0.021 *(-0.56)*	-0.013 *(-0.36)*	-0.017 *(-0.47)*	-0.014 *(-0.37)*	-0.014 *(0.39)*	-0.017 *(-0.47)*	-0.017 *(-0.47)*	-0.015 *(-0.39)*	0.004 *(0.11)*	-0.011 *(-0.29)*
LNAFEE	-0.016 *(-1.86)**									
LNNAF		-0.000 *(-0.03)*								
LNTOTALFEES			-0.013 *(-1.48)*							
FEERATIO1				0.001 *(0.08)*						
FEERATIO2					0.001 *(0.55)*					
SPECLST_ MSLEADER						-0.008 *(-1.35)*				
SPECLST_MS30							-0.006 *(-0.97)*			
SPECLST_MS								-0.005 *(-0.31)*		
SPECLST_PS									-0.074 *(-4.62)****	
SPECLST_ WEIGHTED										-0.160 *(-4.82)****
BRDSIZE	0.004 *(1.40)*	0.003 *(1.25)*	0.004 *(1.37)*	0.003 *(1.24)*	0.003 *(1.24)*	0.003 *(1.32)*	0.003 *(1.27)*	0.003 *(1.23)*	0.003 *(1.32)*	0.004 *(1.42)*
BRDNED	-0.001 *(-0.04)*	-0.014 *(-0.38)*	-0.004 *(-0.10)*	-0.014 *(-0.39)*	-0.015 *(-0.40)*	-0.015 *(-0.43)*	-0.016 *(-0.45)*	-0.015 *(-0.42)*	-0.011 *(-0.30)*	-0.016 *(-0.45)*

Table 6.7 (continued)										
BRDEXP	0.009 *(0.34)*	0.008 *(0.32)*	0.008 *(0.32)*	0.008 *(0.32)*	0.009 *(0.35)*	0.005 *(0.19)*	0.006 *(0.25)*	0.008 *(0.31)*	0.009 *(0.35)*	0.004 *(0.16)*
BRDMEET	0.000 *(0.16)*	0.000 *(0.40)*	0.000 *(0.26)*	0.000 *(0.41)*	0.000 *(0.37)*	0.000 *(0.41)*	0.000 *(0.41)*	0.000 *(0.39)*	0.001 *(0.75)*	0.000 *(0.56)*
ACSIZE	-0.007 *(-1.55)*	-0.007 *(-1.61)*	-0.007 *(-1.61)*	-0.007 *(-1.60)*	-0.007 *(-1.56)*	-0.007 *(-1.61)*	-0.007 *(-1.59)*	-0.007 *(-1.60)*	-0.008 *(-1.77)**	-0.008 *(-1.75)**
ACIND	-0.013 *(-1.54)*	-0.013 *(-1.53)*	-0.013 *(-1.54)*	-0.013 *(-1.53)*	-0.013 *(-1.52)*	-0.013 *(-1.50)*	-0.013 *(-1.46)*	-0.013 *(-1.54)*	-0.011 *(-1.27)*	-0.011 *(-1.31)*
ACEXP	0.007 *(0.49)*	0.007 *(0.48)*	0.007 *(0.50)*	0.007 *(0.48)*	0.007 *(0.46)*	0.008 *(0.53)*	0.008 *(0.57)*	0.007 *(0.48)*	0.011 *(0.76)*	0.011 *(0.74)*
ACMEET	-0.000 *(-0.19)*	-0.001 *(-0.38)*	-0.000 *(-0.14)*	-0.001 *(-0.39)*	-0.001 *(-0.46)*	-0.001 *(-0.49)*	-0.001 *(-0.51)*	-0.001 *(-0.42)*	-0.001 *(-0.45)*	-0.001 *(-0.65)*
INOWN	0.000 *(0.28)*	0.000 *(0.39)*	0.000 *(0.42)*	0.000 *(0.39)*	0.000 *(0.27)*	0.000 *(0.36)*	0.000 *(0.30)*	0.000 *(0.35)*	0.000 *(0.45)*	0.000 *(0.35)*
BLOCK	0.000 *(1.06)*	0.000 *(1.13)*	0.000 *(1.17)*	0.000 *(1.12)*	0.000 *(1.02)*	0.000 *(1.11)*	0.000 *(1.10)*	0.000 *(1.12)*	0.000 *(0.60)*	0.000 *(0.74)*
MTBV	-0.000 *(-2.11)***	-0.000 *(-2.10)***	-0.000 *(-2.01)***	-0.000 *(-2.11)***	-0.000 *(-2.18)***	-0.000 *(-2.00)***	-0.000 *(-2.05)***	-0.000 *(-2.06)***	-0.000 *(-1.83)**	-0.000 *(-1.77)**
LOSS	0.085 *(4.42)****	0.019 *(4.40)****	0.086 *(4.41)****	0.086 *(4.40)****	0.086 *(4.39)****	0.085 *(4.33)****	0.085 *(4.34)****	0.086 *(4.39)****	0.082 *(4.25)****	0.083 *(4.27)****
CFO	0.085 *(2.25)***	0.085 *(2.25)***	0.085 *(2.26)***	0.085 *(2.25)***	0.085 *(2.25)***	0.085 *(2.23)***	0.084 *(2.22)***	0.085 *(2.26)***	0.081 *(2.11)***	0.082 *(2.15)***
LEVERGN	-0.021 *(-1.33)*	-0.025 *(-1.64)*	-0.023 *(-1.44)*	-0.025 *(-1.64)*	-0.025 *(-1.62)*	-0.025 *(-1.62)*	-0.024 *(-1.60)*	-0.025 *(-1.66)**	-0.022 *(-1.47)*	-0.022 *(-1.43)*
LNASSET	0.019 *(3.05)****	0.012 *(1.98)***	0.017 *(2.67)***	0.012 *(2.04)***	0.012 *(2.07)***	0.013 *(2.28)***	0.013 *(2.25)***	0.012 *(2.15)***	0.010 *(1.79)**	0.013 *(2.26)***
Adj. R^2	0.116	0.112	0.115	0.112	0.113	0.115	0.113	0.112	0.135	0.133

Table 6.7 (continued)										
Variable	Coefficient *(t-statistics)*									
	(3) DACCROA									
Model	(u)	(v)	(w)	(x)	(y)	(z)	(aa)	(ab)	(ac)	(ad)
Intercept	-0.061 *(-1.38)*	-0.052 *(-1.18)*	-0.056 *(-1.28)*	-0.049 *(-1.14)*	-0.051 *(-1.18)*	-0.050 *(-1.16)*	-0.050 *(-1.13)*	-0.043 *(-1.01)*	-0.033 *(-0.76)*	-0.048 *(-1.11)*
LNAFEE	-0.025 *(-2.44)***									
LNNAF		-0.002 *(-0.68)*								
LNTOTALFEES			-0.021 *(-1.15)*							
FEERATIO1				-0.002 *(-0.18)*						
FEERATIO2					0.002 *(0.65)*					
SPECLST_ MSLEADER						-0.001 *(-0.14)*				
SPECLST_MS30							0.001 *(0.09)*			
SPECLST_MS								0.027 *(1.54)*		
SPECLST_PS									-0.074 *(-4.66)****	
SPECLST_ WEIGHTED										-0.103 *(- 2.80)****
BRDSIZE	0.003 *(1.28)*	0.002 *(1.03)*	0.003 *(1.25)*	0.002 *(1.00)*	0.002 *(0.99)*	0.002 *(0.99)*	0.002 *(0.98)*	0.002 *(0.82)*	0.002 *(1.07)*	0.003 *(1.12)*

Table 6.7 (continued)										
BRDNED	0.007 *(0.15)*	-0.011 *(-0.27)*	0.003 *(0.08)*	-0.013 *(-0.34)*	-0.014 *(-0.36)*	-0.013 *(-0.34)*	-0.013 *(-0.33)*	-0.008 *(-0.21)*	-0.010 *(-0.26)*	-0.014 *(-0.37)*
BRDEXP	0.027 *(1.09)*	0.026 *(1.05)*	0.026 *(1.05)*	0.026 *(1.05)*	0.027 *(1.10)*	*0.025* *(1.05)*	0.026 *(1.07)*	0.028 *(1.17)*	0.026 *(1.09)*	0.023 *(0.94)*
BRDMEET	-0.000 *(-0.06)*	0.000 *(0.25)*	0.000 *(0.07)*	0.000 *(0.29)*	0.000 *(0.23)*	0.000 *(0.28)*	0.000 *(0.28)*	0.000 *(0.43)*	0.000 *(0.60)*	0.000 *(0.37)*
ACSIZE	-0.001 *(-0.27)*	-0.002 *(-0.38)*	-0.002 *(-0.36)*	-0.002 *(-0.36)*	-0.002 *(-0.31)*	-0.002 *(-0.35)*	-0.002 *(-0.35)*	-0.002 *(-0.33)*	-0.002 *(-0.50)*	-0.002 *(-0.44)*
ACIND	-0.009 *(-1.07)*	-0.009 *(-1.04)*	-0.009 *(-1.07)*	-0.009 *(-1.04)*	-0.008 *(-1.04)*	-0.009 *(-1.05)*	-0.009 *(-1.05)*	-0.010 *(-1.19)*	-0.006 *(-0.76)*	-0.007 *(-0.88)*
ACEXP	-0.005 *(-0.31)*	-0.005 *(-0.34)*	-0.005 *(-0.30)*	-0.005 *(-0.33)*	-0.006 *(-0.37)*	-0.005 *(-0.33)*	-0.005 *(-0.34)*	-0.006 *(-0.35)*	-0.001 *(-0.06)*	-0.003 *(-0.16)*
ACMEET	-0.003 *(-1.23)*	-0.004 *(-1.43)*	-0.003 *(-1.14)*	-0.004 *(-1.51)*	-0.004 *(-1.61)*	-0.004 *(-1.52)*	-0.004 *(-1.49)*	-0.003 *(-1.32)*	-0.004 *(-1.61)*	-0.004 *(-1.70)*
INOWN	0.000 *(0.65)*	0.000 *(0.85)*	0.000 *(0.87)*	0.000 *(0.83)*	0.000 *(0.65)*	0.000 *(0.80)*	0.000 *(0.81)*	0.000 *(0.95)*	0.000 *(0.88)*	0.000 *(0.79)*
BLOCK	0.000 *(0.71)*	0.000 *(0.84)*	0.000 *(0.89)*	0.000 *(0.83)*	0.000 *(0.68)*	0.000 *(0.81)*	0.000 *(0.82)*	0.000 *(0.79)*	0.000 *(0.25)*	0.000 *(0.54)*
MTBV	0.000 *(0.61)*	0.000 *(0.72)*	0.000 *(0.78)*	0.000 *(0.73)*	0.000 *(0.58)*	0.000 *(0.72)*	0.000 *(0.72)*	0.000 *(0.66)*	0.000 *(1.04)*	0.000 *(0.96)*
LOSS	0.108 *(5.71)*****	0.109 *(5.58)*****	0.109 *(5.72)*****	0.109 *(5.58)*****	0.109 *(5.55)*****	0.109 *(5.57)*****	0.109 *(5.59)*****	0.111 *(5.66)*****	0.106 *(5.48)*****	0.107 *(5.51)*****
CFO	0.065 *(1.78)**	0.065 *(1.80)**	0.065 *(1.80)**	0.065 *(1.79)**	0.065 *(1.79)**	0.065 *(1.79)**	0.065 *(1.79)**	0.063 *(1.80)**	0.062 *(1.67)**	0.064 *(1.96)**
LEVERGN	-0.015 *(-1.10)*	-0.021 *(-1.59)*	-0.017 *(-1.27)*	-0.022 *(-1.63)*	-0.021 *(-1.59)*	-0.022 *(-1.62)*	-0.022 *(-1.63)*	-0.024 *(-1.75)**	-0.019 *(-1.40)*	-0.019 *(-1.45)*
LNASSET	0.028 *(3.75)*****	0.018 *(2.69)*****	0.026 *(3.31)*****	0.018 *(2.65)*****	0.018 *(2.69)*****	0.018 *(2.70)*****	0.017 *(2.64)*****	0.015 *(2.26)***	0.016 *(2.43)***	0.018 *(2.76)***
Adj. R^2	0.143	0.134	0.141	0.134	0.135	0.134	0.133	0.139	0.156	0.142
*** are significant at *p*<0.01, ** are significant at *p*<0.05 and *at *p*<0.10.										

Table 6.8: Fixed or random effect estimator			
Hausman test			
H_0 = The preferred model is random effect Reject H_0 if chi-square was more than 0.05.			
Model	Dependent variable (*DACC)*	chi2(16)	Prob > chi2
a	*DACCJM*	25.49	0.061
b	*DACCJM*	24.22	0.085
c	*DACCJM*	23.92	0.091
d	*DACCJM*	30.17	0.017
e	*DACCJM*	29.58	0.020
f	*DACCJM*	41.19	0.000
g	*DACCJM*	26.81	0.043
h	*DACCJM*	28.70	0.026
i	*DACCJM*	30.04	0.017
j	*DACCJM*	30.14	0.017
k	*DACCMJM*	25.53	0.061
l	*DACCMJM*	24.68	0.075
m	*DACCMJM*	23.47	0.102
n	*DACCMJM*	30.20	0.017
o	*DACCMJM*	37.95	0.001
p	*DACCMJM*	29.63	0.020
q	*DACCMJM*	27.80	0.033
r	*DACCMJM*	27.88	0.032
s	*DACCMJM*	30.48	0.015
t	*DACCMJM*	30.65	0.014
u	*DACCROA*	26.21	0.051
v	*DACCROA*	25.75	0.057
w	*DACCROA*	24.13	0.086
x	*DACCROA*	30.18	0.017
y	*DACCROA*	38.50	0.001
z	*DACCROA*	28.93	0.024
aa	*DACCROA*	26.03	0.053
ab	*DACCROA*	28.93	0.024
ac	*DACCROA*	27.85	0.033
ad	*DACCROA*	27.22	0.039

Table 6.9: The results of fixed-effect/ random effect estimators for the earnings management model (*N*=613)										
Variable	Coefficient *(z-statistics)*									
	(1) DACCJM									
Model	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
Intercept	-0.031 *(-0.68)*	-0.022 *(-0.48)*	-0.028 *(-0.60)*	-0.709 *(-3.12)****	-0.699 *(-3.05)****	-0.730 *(-3.33)****	-0.741 *(-3.27)****	-0.732 *(-3.30)****	-0.740 *(-3.39)****	-0.759 *(-3.48)****
LNAFEE	-0.017 *(-1.95)**									
LNNAF		0.001 *(0.34)*								
LNTOTALFEES			-0.013 *(-1.38)*							
FEERATIO1				-0.018 *(-0.78)*						
FEERATIO2					-0.005 *(-1.40)*					
SPECLST_ MSLEADER						-0.038 *(-2.78)****				
SPECLST_MS30							-0.007 *(-0.73)*			
SPECLST_MS								-0.070 *(-1.55)*		
SPECLST_PS									-0.176 *(-3.88)****	
SPECLST_ WEIGHTED										-0.350 *(-5.30)****
BRDSIZE	0.004 *(1.59)*	0.003 *(1.40)*	0.004 *(1.54)*	0.005 *(1.13)*	0.005 *(1.10)*	0.005 *(1.23)*	0.005 *(1.21)*	0.005 *(1.17)*	0.006 *(1.41)*	0.006 *(1.35)*

Table 6.9 (continued)										
BRDNED	-0.009 *(-0.25)*	-0.005 *(-0.15)*	0.006 *(0.18)*	0.040 *(0.68)*	0.037 *(0.64)*	0.025 *(0.44)*	-0.040 *(-0.67)*	0.030 *(0.51)*	0.024 *(0.40)*	0.024 *(0.40)*
BRDEXP	0.019 *(0.60)*	0.018 *(0.56)*	0.018 *(0.57)*	0.054 *(0.88)*	0.054 *(0.87)*	0.053 *(0.88)*	0.055 *(0.89)*	0.052 *(0.84)*	0.062 *(1.03)*	0.055 *(0.91)*
BRDMEET	0.001 *(0.44)*	0.001 *(0.65)*	0.000 *(0.53)*	-0.001 *(-0.31)*	-0.001 *(-0.28)*	-0.001 *(-0.45)*	0.000 *(0.39)*	-0.001 *(-0.54)*	-0.001 *(-0.27)*	-0.001 *(-0.34)*
ACSIZE	-0.006 *(-1.26)*	-0.007 *(-1.30)*	-0.007 *(-1.30)*	-0.007 *(-0.92)*	-0.007 *(-0.97)*	-0.004 *(-0.60)*	-0.007 *(-0.94)*	-0.006 *(-0.83)*	-0.006 *(-0.80)*	-0.006 *(-0.82)*
ACIND	-0.012 *(-1.34)*	-0.011 *(-1.29)*	-0.012 *(-1.32)*	-0.011 *(-1.30)*	-0.011 *(-1.27)*	-0.011 *(-1.26)*	-0.011 *(-1.33)*	-0.012 *(-1.35)*	-0.011 *(-1.23)*	-0.010 *(-1.11)*
ACEXP	0.002 *(0.15)*	0.003 *(0.16)*	0.003 *(0.17)*	-0.007 *(-0.26)*	-0.006 *(-0.24)*	-0.007 *(-0.28)*	-0.007 *(-0.27)*	-0.006 *(-0.23)*	-0.010 *(-0.38)*	-0.008 *(-0.31)*
ACMEET	-0.001 *(-0.39)*	-0.001 *(-0.59)*	-0.001 *(-0.37)*	-0.001 *(-0.26)*	-0.001 *(-0.23)*	-0.001 *(-0.25)*	-0.002 *(-0.29)*	-0.002 *(-0.32)*	-0.002 *(-0.26)*	-0.002 *(-0.29)*
INOWN	0.000 *(0.64)*	0.000 *(0.73)*	0.000 *(0.79)*	0.000 *(2.00)***	0.000 *(2.22)***	0.000 *(1.89)**	0.000 *(1.79)**	0.000 *(1.90)**	0.000 *(2.13)***	0.000 *(2.14)***
BLOCK	0.000 *(1.11)*	0.000 *(1.15)*	0.000 *(1.21)*	0.000 *(0.39)*	0.000 *(0.44)*	0.000 *(0.21)*	0.000 *(0.45)*	0.000 *(0.38)*	0.000 *(0.28)*	0.000 *(0.21)*
MTBV	-0.000 *(-1.99)***	-0.000 *(-1.97)***	-0.000 *(-2.01)**	-0.000 *(-1.83)**	-0.000 *(-1.75)**	-0.000 *(-1.74)**	-0.000 *(-1.75)**	-0.000 *(-1.75)**	-0.000 *(-1.93)**	-0.000 *(-1.99)***
LOSS	0.081 *(4.07)****	0.081 *(4.04)****	0.081 *(4.06)****	0.073 *(2.78)****	0.074 *(2.88)****	0.073 *(2.87)****	0.075 *(2.89)****	0.074 *(2.87)****	0.074 *(2.93)****	0.074 *(2.92)****
CFO	0.086 *(2.16)***	0.085 *(2.12)***	-0.085 *(-2.16)***	-0.033 *(-0.54)*	-0.031 *(-0.52)*	-0.037 *(-0.59)*	0.038 *(0.60)*	-0.037 *(-0.59)*	-0.036 *(-0.59)*	-0.036 *(-0.58)*
LEVERGN	-0.025 *(-1.49)*	-0.030 *(-1.80)**	-0.027 *(-1.60)*	-0.018 *(-0.43)*	-0.020 *(-0.47)*	-0.016 *(-0.36)*	-0.019 *(-0.44)*	-0.015 *(-0.34)*	-0.012 *(-0.29)*	-0.010 *(-0.22)*
LNASSET	0.019 *(2.78)****	0.011 *(1.56)*	0.017 *(2.19)****	0.121 *(2.98)****	0.120 *(2.90)***	0.126 *(3.15)****	0.126 *(3.06)****	0.129 *(3.19)****	0.128 *(3.24)****	0.131 *(3.31)****
R^2	0.112	0.107	0.074	0.121	0.122	0.126	0.122	0.125	0.137	0.142

Table 6.9 (continued)										
Variable	Coefficient *(t-statistics)*									
	(2) DACCMJM									
Model	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)	(t)
Intercept	-0.021 *(-0.48)*	-0.014 *(-0.31)*	-0.017 *(-0.47)*	-0.699 *(-3.11)****	-0.392 *(-3.05)****	-0.722 *(-3.31)****	-0.724 *(-3.23)****	-0.723 *(-3.28)****	-0.732 *(-3.37)****	-0.750 *(-3.45)****
LNAFEE	-0.016 *(-1.85)**									
LNNAF		-0.000 *(-0.02)*								
LNTOTALFEES			-0.013 *(-1.48)*							
FEERATIO1				-0.021 *(-0.91)*						
FEERATIO2					-0.005 *(-1.42)*					
SPECLST_ MSLEADER						-0.033 *(-2.34)***				
SPECLST_MS30							-0.001 *(-0.12)*			
SPECLST_MS								-0.030 *(-0.61)*		
SPECLST_PS									-0.163 *(-2.85)****	
SPECLST_ WEIGHTED										-0.329 *(-4.22)****
BRDSIZE	0.004 *(1.59)*	0.003 *(1.43)*	0.004 *(1.37)*	0.003 *(0.81)*	0.003 *(0.77)*	0.004 *(0.88)*	0.004 *(0.86)*	0.004 *(0.86)*	0.005 *(1.06)*	0.004 *(1.01)*
BRDNED	0.006 *(0.17)*	-0.005 *(-0.16)*	-0.004 *(-0.10)*	0.049 *(0.82)*	0.046 *(0.79)*	0.037 *(0.62)*	0.050 *(0.83)*	0.045 *(0.76)*	0.034 *(0.56)*	0.033 *(0.55)*

Table 6.9 (continued)										
BRDEXP	0.013 *(0.46)*	0.012 *(0.43)*	0.008 *(0.32)*	0.052 *(0.82)*	0.052 *(0.81)*	0.051 *(0.81)*	0.052 *(0.82)*	0.051 *(0.80)*	0.059 *(0.95)*	0.053 *(0.84)*
BRDMEET	0.000 *(0.14)*	0.000 *(0.36)*	0.000 *(0.26)*	-0.001 *(-0.44)*	-0.001 *(-0.42)*	-0.001 *(-0.57)*	-0.001 *(-0.52)*	-0.001 *(-0.58)*	-0.001 *(-0.42)*	-0.001 *(-0.48)*
ACSIZE	-0.007 *(-1.34)*	-0.007 *(-1.39)*	-0.007 *(-1.61)*	-0.006 *(-0.87)*	-0.007 *(-0.93)*	-0.004 *(-0.58)*	-0.006 *(-0.89)*	-0.006 *(-0.83)*	-0.005 *(-1.75)*	-0.005 *(-0.76)*
ACIND	-0.013 *(-1.46)*	-0.013 *(-1.42)*	-0.013 *(-1.54)*	-0.013 *(-1.58)*	-0.013 *(-1.55)*	-0.013 *(-1.54)*	-0.014 *(-1.61)*	-0.014 *(-1.62)*	-0.013 *(-1.49)*	-0.012 *(-1.37)*
ACEXP	0.006 *(0.38)*	0.006 *(0.39)*	0.007 *(0.50)*	-0.001 *(-0.05)*	-0.001 *(-0.03)*	-0.002 *(-0.07)*	-0.002 *(-0.07)*	-0.001 *(-0.05)*	-0.004 *(-0.16)*	-0.003 *(-0.10)*
ACMEET	-0.000 *(-0.37)*	-0.001 *(-0.54)*	-0.000 *(-0.14)*	-0.002 *(-0.32)*	-0.002 *(-0.29)*	-0.002 *(-0.32)*	-0.002 *(-0.33)*	-0.002 *(-0.35)*	-0.002 *(-0.33)*	-0.002 *(-0.35)*
INOWN	0.000 *(0.42)*	0.000 *(0.54)*	0.000 *(0.42)*	0.000 *(1.57)*	0.000 *(1.75)**	0.000 *(1.46)*	0.000 *(1.35)*	0.000 *(1.41)*	0.000 *(1.69)**	0.000 *(1.68)**
BLOCK	0.000 *(1.08)*	0.000 *(1.13)*	0.000 *(1.17)*	0.000 *(0.30)*	0.000 *(0.36)*	0.000 *(0.17)*	0.000 *(0.39)*	0.000 *(0.35)*	0.000 *(0.22)*	0.000 *(0.14)*
MTBV	-0.000 *(-1.87)**	-0.000 *(-1.86)**	-0.000 *(-2.01)***	-0.000 *(-1.71)**	-0.000 *(-1.66)**	-0.000 *(-1.61)*	-0.000 *(-1.64)*	-0.000 *(-1.62)*	-0.000 *(-1.77)**	-0.000 *(-1.83)**
LOSS	0.086 *(4.28)****	0.086 *(4.25)****	0.086 *(4.41)****	0.079 *(2.92)****	0.080 *(3.02)****	0.079 *(3.02)****	0.080 *(3.01)****	0.080 *(3.01)****	0.080 *(3.06)****	0.079 *(3.06)****
CFO	0.089 *(2.35)***	0.089 *(2.32)***	0.085 *(2.26)***	-0.040 *(-0.66)*	-0.039 *(-0.66)*	-0.046 *(-0.72)*	-0.046 *(-0.72)*	-0.046 *(-0.72)*	-0.045 *(-0.72)*	-0.044 *(-0.72)*
LEVERGN	-0.022 *(-1.33)*	-0.026 *(-1.61)*	-0.023 *(-1.44)*	-0.016 *(-0.38)*	-0.018 *(-0.43)*	-0.014 *(-0.33)*	-0.017 *(-0.40)*	-0.015 *(-0.36)*	-0.010 *(-0.25)*	-0.008 *(-0.19)*
LNASSET	0.017 *(2.61)****	0.011 *(1.61)*	0.017 *(2.67)***	0.12 *(2.97)****	0.012 *(2.91)***	0.126 *(3.13)****	0.125 *(3.01)****	0.127 *(3.12)****	0.129 *(3.22)****	0.131 *(3.28)****
Adj. R^2	0.112	0.117	0.115	0.131	0.134	0.137	0.129	0.130	0.143	0.148

Table 6.9 (continued)										
Variable	Coefficient *(t-statistics)*									
	(3) DACCROA									
Model	(u)	(v)	(w)	(x)	(y)	(z)	(aa)	(ab)	(ac)	(ad)
Intercept	-0.062 *(-1.29)*	-0.053 *(-1.09)*	-0.056 *(-1.28)*	-0.656 *(-3.05)****	-0.660 *(-3.05)****	-0.690 *(-3.30)****	-0.687 *(-3.21)****	-0.689 *(-3.27)****	-0.695 *(-3.32)****	-0.704 *(-3.35)****
LNAFEE	-0.024 *(-2.56)***									
LNNAF		-0.003 *(-0.71)*								
LNTOTALFEES			-0.021 *(-1.15)*							
FEERATIO1				-0.031 *(-1.35)*						
FEERATIO2					-0.005 *(-1.49)*					
SPECLST_ MSLEADER						-0.028 *(-2.07)***				
SPECLST_MS30							0.001 *(0.10)*			
SPECLST_MS								-0.003 *(-0.06)*		
SPECLST_PS									-0.107 *(-1.78)**	
SPECLST_ WEIGHTED										-0.176 *(-1.87)**
BRDSIZE	0.003 *(1.59)*	0.003 *(1.30)*	0.003 *(1.25)*	0.002 *(0.37)*	0.002 *(0.35)*	0.002 *(0.45)*	0.002 *(0.44)*	0.002 *(0.45)*	0.002 *(0.57)*	0.002 *(0.51)*

Table 6.9 (continued)										
BRDNED	0.015 *(0.39)*	-0.000 *(-0.01)*	0.003 *(0.08)*	0.115 *(1.63)*	0.112 *(1.61)*	0.104 *(1.55)*	0.115 *(1.63)*	0.116 *(1.64)*	0.106 *(1.57)*	0.108 *(1.59)*
BRDEXP	0.031 *(1.15)*	0.029 *(1.09)*	0.026 *(1.05)*	0.067 *(1.07)*	0.067 *(1.07)*	*0.066* *(1.07)*	0.067 *(1.08)*	0.067 *(1.07)*	0.072 *(1.17)*	0.067 *(1.09)*
BRDMEET	-0.000 *(-0.06)*	0.000 *(0.25)*	0.000 *(0.07)*	0.002 *(0.68)*	0.001 *(0.65)*	0.001 *(0.51)*	0.001 *(0.55)*	0.001 *(0.53)*	0.001 *(0.63)*	0.001 *(0.58)*
ACSIZE	-0.001 *(-0.15)*	-0.001 *(-0.25)*	-0.002 *(-0.36)*	-0.003 *(-0.40)*	-0.004 *(-0.46)*	-0.002 *(-0.20)*	-0.004 *(-0.43)*	-0.004 *(-0.42)*	-0.003 *(-0.34)*	-0.003 *(-0.36)*
ACIND	-0.009 *(-1.12)*	-0.009 *(-1.05)*	-0.009 *(-1.07)*	-0.013 *(-1.31)*	-0.013 *(-1.31)*	-0.013 *(-1.35)*	-0.014 *(-1.41)*	-0.014 *(-1.41)*	-0.013 *(-1.33)*	-0.013 *(-1.30)*
ACEXP	-0.006 *(-0.37)*	-0.006 *(-0.38)*	-0.005 *(-0.30)*	-0.013 *(-0.53)*	-0.013 *(-0.52)*	-0.014 *(-0.58)*	-0.014 *(-0.58)*	-0.014 *(-0.58)*	-0.016 *(-0.64)*	-0.015 *(-0.59)*
ACMEET	-0.003 *(-1.17)*	-0.003 *(-1.31)*	-0.003 *(-1.14)*	0.002 *(-1.41))*	0.002 *(0.43)*	0.002 *(0.40)*	0.002 *(0.40)*	0.002 *(0.39)*	0.002 *(0.39)*	0.002 *(0.38)*
INOWN	0.000 *(0.82)*	0.000 *(1.04)*	0.000 *(0.87)*	0.001 *(2.13)***	0.000 *(2.19)***	0.000 *(1.77)**	0.000 *(1.68)**	0.000 *(1.69)**	0.000 *(1.97)**	0.001 *(1.92)**
BLOCK	0.000 *(0.76)*	0.000 *(0.88)*	0.000 *(0.89)*	0.000 *(0.76)*	0.000 *(0.88)*	0.000 *(0.68)*	0.000 *(0.90)*	0.000 *(0.90)*	0.000 *(0.77)*	0.000 *(0.74)*
MTBV	0.000 *(0.48)*	0.000 *(0.61)*	0.000 *(0.78)*	-0.000 *(-0.39)*	-0.000 *(-0.18)*	-0.000 *(-0.35)*	-0.000 *(-0.39)*	-0.000 *(-0.39)*	-0.000 *(-0.30)*	-0.000 *(-0.26)*
LOSS	0.111 *(5.53)****	0.111 *(5.40)****	0.109 *(5.72)****	0.117 *(4.89)****	0.118 *(5.06)****	0.118 *(5.05)****	0.119 *(5.01)****	0.119 *(5.01)****	0.119 *(5.08)****	0.118 *(5.08)****
CFO	0.070 *(1.89)**	0.070 *(1.88)**	0.065 *(1.80)**	0.012 *(0.20)*	0.010 *(0.17)*	0.004 *(0.07)*	0.004 *(0.07)*	0.004 *(0.07)*	0.005 *(0.08)*	0.005 *(0.08)*
LEVERGN	-0.016 *(-1.10)*	-0.022 *(-1.56)*	-0.017 *(-1.27)*	-0.017 *(-0.41)*	-0.019 *(-0.47)*	-0.016 *(-0.38)*	-0.019 *(-0.44)*	-0.019 *(-0.44)*	-0.015 *(-0.34)*	-0.014 *(-0.33)*
LNASSET	0.027 *(3.40)****	0.017 *(2.34)****	0.026 *(3.31)****	0.104 *(2.78)****	0.104 *(2.77)****	0.109 *(2.99)****	0.107 *(2.87)****	0.108 *(2.94)****	0.111 *(3.04)****	0.111 *(3.05)****
R^2	0.146	0.137	0.141	0.188	0.188	0.189	0.184	0.189	0.189	0.189
*** are significant at *p*<0.01, ** are significant at *p*<0.05 and *at *p*<0.10.										

Table 6.10: The results of earning management model for the alternative test variable definitions (*N*=613)									
Dependent variable	Coefficient *(z-statistics)*								
	DACCJM			*DACCMJM*			*DACCROA*		
Model	(a)	(i)	(j)	(k)	(s)	(t)	(u)	(ac)	(ad)
Intercept	0.019 *(0.39)*	0.043 *(0.89)*	0.030 *(0.62)*	0.015 *(0.32)*	0.037 *(0.80)*	0.024 *(0.52)*	-0.044 *(-0.88)*	-0.017 *(-0.34)*	-0.030 *(-0.60)*
LNAFEE	-0.019 *(-2.58)***			-0.017 *(-2.29)***			-0.025 *(-2.89)****		
SPECLST_PS		-0.078 *(-4.85)****			-0.076 *(-4.88)****			-0.075 *(-4.83)****	
SPECLST_ WEIGHTED			-0.161 *(-4.95)****			-0.156 *(-4.92)****			-0.095 *(-2.54)***
BRDSIZE1	0.007 *(0.89)*	0.006 *(0.79)*	0.007 *(0.87)*	0.005 *(0.66)*	0.004 *(0.57)*	0.005 *(0.65)*	0.001 *(0.22)*	0.000 *(0.07)*	0.001 *(0.15)*
BRDNED1	0.005 *(0.53)*	0.004 *(0.42)*	0.032 *(0.34)*	0.005 *(0.54)*	0.004 *(0.44)*	0.003 *(0.36)*	0.002 *(0.20)*	0.001 *(0.06)*	0.000 *(0.01)*
BRDEXP	0.015 *(0.60)*	0.016 *(0.64)*	0.010 *(0.39)*	0.008 *(0.33)*	0.009 *(0.37)*	0.003 *(0.12)*	0.018 *(0.78)*	0.019 *(0.81)*	0.014 *(0.62)*
BRDMEET	-0.000 *(-0.32)*	0.000 *(0.28)*	0.000 *(0.02)*	-0.001 *(-0.57)*	0.001 *(0.01)*	-0.000 *(-0.26)*	-0.001 *(-0.74)*	-0.000 *(-0.08)*	-0.000 *(-0.35)*
ACSIZE	-0.005 *(-1.35)*	-0.007 *(-1.89)***	-0.007 *(-1.85)**	-0.005 *(-1.41)*	-0.007 *(-1.91)**	-0.007 *(-1.87)**	0.002 *(0.44)*	-0.000 *(-0.05)*	0.000 *(0.04)*
ACIND1	-0.022 *(-1.65)*	-0.022 *(-1.69)**	-0.023 *(-1.73)**	-0.024 *(-1.71)**	-0.023 *(-1.76)**	-0.024 *(-1.79)**	-0.018 *(-1.88)**	-0.018 *(-1.92)**	-0.019 *(-1.97)**
ACEXP1	-0.007 *(-0.48)*	-0.002 *(-0.15)*	-0.003 *(-0.18)*	-0.005 *(-0.04)*	0.004 *(0.32)*	0.004 *(0.30)*	-0.003 *(-0.28)*	0.001 *(0.09)*	-0.001 *(-0.08)*

Table 6.10 (continued)									
ACMEET1	0.008 *(1.14)*	0.007 *(1.07)*	0.007 *(0.99)*	0.006 *(0.92)*	0.006 *(0.85)*	0.005 *(0.77)*	-0.001 *(-0.09)*	-0.001 *(-0.22)*	-0.002 *(-0.28)*
INOWN	0.000 *(0.38)*	0.000 *(0.62)*	0.000 *(0.54)*	0.000 *(0.40)*	0.000 *(0.64)*	0.000 *(0.55)*	0.000 *(0.62)*	0.000 *(0.92)*	0.000 *(0.82)*
BLOCK	0.000 *(1.31)*	0.000 *(0.85)*	0.000 *(1.01)*	0.000 *(1.32)*	0.000 *(0.87)*	0.000 *(1.02)*	0.000 *(0.96)*	0.000 *(0.43)*	0.000 *(0.73)*
MTBV	-0.000 *(-1.93)**	-0.000 *(-1.71)**	-0.000 *(-1.63)*	-0.000 *(-2.02)***	-0.000 *(-1.78)**	-0.000 *(-1.72)***	0.000 *(0.56)*	0.000 *(0.97)*	0.000 *(0.87)*
LOSS	0.083 *(4.38)****	0.080 *(4.21)****	0.081 *(4.23)****	0.087 *(4.34)****	0.084 *(4.19)****	0.084 *(4.20)****	0.109 *(5.56)****	0.106 *(5.37)****	0.108 *(5.39)****
CFO	0.097 *(2.51)***	0.093 *(2.37)***	0.095 *(2.41)***	0.096 *(2.62)***	0.092 *(2.48)***	0.094 *(2.51)***	0.072 *(2.01)***	0.068 *(1.89)**	0.071 *(1.96)**
LEVERGN	-0.021 *(-1.28)*	-0.022 *(-1.47)*	-0.022 *(-1.43)*	-0.019 *(-1.18)*	-0.020 *(-1.32)*	-0.019 *(-1.28)*	-0.013 *(-0.91)*	-0.017 *(-1.24)*	-0.018 *(-1.33)*
LNASSET	0.020 *(3.39)****	0.010 *(1.80)**	0.012 *(2.27)***	0.020 *(3.36)**	0.010 *(1.99)***	0.013 *(2.46)***	0.029 *(3.96)***	0.015 *(2.54)***	0.017 *(2.84)****
Adj. R^2	0.110	0.129	0.126	0.116	0.135	0.132	0.143	0.156	0.140
*** are significant at *p*<0.01, ** are significant at *p*<0.05 and *at *p*<0.10.									

Table 6.11: Endogeneity test for the earnings management model									
Durbin-Wu-Hausman Test									
H_0 = the residual of *LNAFEE, SPECLST_PS, SPECLST_WEIGHTED, BRDSIZE, BDRNED, BRDMEET, BRDEXP, ACSIZE, ACIND1, ACMEET* and *ACEXP* are exogenous Reject H_0 if F-statistic significant									
Variable	Chi2 (1)								
	DACCJM			*DACCMJM*			*DACCROA*		
	Model (a)	Model (i)	Model (j)	Model (k)	Model (s)	Model (t)	Model (u)	Model (ac)	Model (ad)
LNAFEE	5.621 (p=0.017)			5.818 (p=0.015)			2.466 (p=0.116)		
SPECLST_ PS		1.826 (p=0.176)			1.875 (p=0.171)			0.489 (p=0.484)	
SPECLST_ WEIGHTED			1.637 (p=0.208)			1.054 (p=0.306)			0.212 (p=0.644)
BRDSIZE	1.826 (p=0.176)	1.837 (p=0.175)	1.585 (p=0.208)	1.046 (p=0.306)	1.012 (p=0.314)	0.824 (p=0.363)	0.319 (p=0.572)	0.379 (p=0.537)	0.385 (p=0.534)
BRDNED	0.353 (p=0.552)	0.549 (p=0.458)	0.626 (p=0.428)	0.232 (p=0.629)	0.372 (p=0.541)	0.435 (p=0.509)	1.235 (p=0.266)	1.788 (p=0.181)	1.890 (p=0.169)
BRDEXP	0.842 (p=0.358)	1.168 (p=0.279)	1.164 (p=0.280)	0.501 (p=0.478)	0.711 (p=0.399)	0.708 (p=0.399)	0.714 (p=0.398)	1.042 (p=0.307)	0.995 (p=0.318)
BRDMEET	0.312 (p=0.575)	0.008 (p=0.929)	0.058 (p=0.809)	0.256 (p=0.612)	0.003 (p=0.954)	0.042 (p=0.835)	4.347 (p=0.037)	1.042 (p=0.307)	3.087 (p=0.078)
ACSIZE	0.633 (p=0.426)	0.864 (p=0.352)	0.855 (p=0.355)	0.056 (p=0.813)	0.122 (p=0.727)	0.117 (p=0.731)	0.002 (p=0.962)	0.009 (p=0.920)	0.011 (p=0.916)
ACIND1	0.860 (p=0.353)	0.926 (p=0.335)	0.888 (p=0.346)	0.804 (p=0.369)	0.864 (p=0.352)	0.830 (p=0.362)	1.016 (p=0.313)	1.074 (p=0.299)	1.007 (p=0.315)
ACEXP	2.564 (p=0.109)	2.985 (p=0.084)	2.924 (p=0.087)	2.124 (p=0.145)	2.475 (p=0.116)	2.427 (p=0.119)	2.423 (p=0.119)	2.797 (p=0.094)	2.570 (p=0.108)
ACMEET	0.169 (p=0.680)	0.353 (p=0.552)	0.465 (p=0.495)	0.216 (p=0.641)	0.417 (p=0.518)	0.537 (p=0.463)	1.193 (p=0.165)	2.500 (p=0.114)	2.512 (p=0.113)

Table 6.12: The results of 2SLS regression for earnings management model							
Dependent variable	Coefficient *(z-statistics)*						
	DACCJM			*DACCMJM*	*DACCROA*		
Model	(a)	(i)	(j)	(k)	(u)	(ac)	(ad)
Intercept	-0.035 *(-0.88)*	0.002 *(0.06)*	-0.015 *(-0.38)*	-0.029 *(-0.78)*	-0.047 *(-1.06)*	-0.033 *(-0.74)*	-0.035 *(-0.80)*
LNAFEE	-0.047 *(-3.07)****			-0.044 *(-2.98)****	-0.027 *(-2.80)****		
SPECLST_PS		-0.086 *(-4.59)****				-0.082 *(-4.59)****	
SPECLST_ WEIGHTED			-0.185 *(-4.72)****				-0.097 *(-2.64)****
BRDSIZE	0.005 *(1.75)**	0.000 *(0.11)*	0.001 *(0.24)*	0.005 *(1.74)**	0.003 *(1.17)*	-0.000 *(-0.16)*	0.002 *(0.99)*
BRDNED	0.027 *(0.68)*	-0.016 *(-0.45)*	-0.022 *(-0.62)*	0.025 *(0.62)*	0.012 *(0.32)*	-0.014 *(-0.35)*	-0.010 *(-0.26)*
BRDEXP	0.018 *(0.67)*	-0.096 *(-1.39)*	-0.100 *(-1.45)*	0.014 *(0.53)*	0.028 *(1.17)*	-0.076 *(-1.12)*	0.025 *(1.02)*
BRDMEET	-0.00 *(-0.12)*	0.001 *(0.94)*	0.001 *(0.74)*	-0.00 *(-0.36)*	-0.001 *(-1.43)*	0.000 *(0.50)*	-0.001 *(-0.85)*
ACSIZE	-0.006 *(-1.37)*	-0.001 *(-0.26)*	-0.001 *(-0.25)*	-0.006 *(-1.42)*	-0.000 *(-0.09)*	0.004 *(0.67)*	-0.007 *(-0.26)*
ACIND	-0.013 *(-1.57)*	-0.011 *(-1.29)*	-0.011 *(-1.32)*	-0.014 *(-1.64)*	-0.008 *(-1.04)*	-0.007 *(-0.90)*	-0.006 *(-0.86)*
ACEXP	0.004 *(0.25)*	0.132 *(1.75)**	0.131 *(1.73)**	0.007 *(0.45)*	-0.005 *(-0.31)*	0.116 *(1.58)*	-0.003 *(-0.17)*

Table 6.12 (continued)							
ACMEET	0.001 *(0.31)*	0.000 *(0.16)*	-0.000 *(-0.06)*	0.000 *(0.19)*	-0.002 *(-0.79)*	-0.003 *(-1.06)*	-0.003 *(-1.29)*
INOWN	0.000 *(0.16)*	0.000 *(0.48)*	0.000 *(0.36)*	0.000 *(0.07)*	0.000 *(0.33)*	0.000 *(0.78)*	0.000 *(0.50)*
BLOCK	0.000 *(0.97)*	0.000 *(0.33)*	0.000 *(0.49)*	0.000 *(0.98)*	0.000 *(0.60)*	-0.000 *(-0.05)*	0.000 *(0.47)*
MTBV	-0.000 *(-2.02)***	-0.000 *(-1.12)*	-0.000 *(-0.99)*	-0.000 *(-2.12)***	0.000 *(0.53)*	0.000 *(1.33)*	0.000 *(0.91)*
LOSS	0.082 *(4.54)****	0.076 *(4.35)****	0.077 *(4.37)****	0.086 *(4.52)****	0.110 *(5.96)****	0.104 *(5.49)****	0.110 *(5.73)****
CFO	0.095 *(2.50)***	0.082 *(2.15)***	0.084 *(2.19)***	0.094 *(2.60)****	0.072 *(2.01)***	0.060 *(1.69)**	0.071 *(1.98)***
LEVERGN	-0.014 *(-0.96)*	-0.021 *(-1.33)*	-0.020 *(-1.29)*	-0.012 *(-0.84)*	-0.011 *(-0.81)*	-0.015 *(-1.06)*	-0.016 *(-1.23)*
LNASSET	0.029 *(3.58)****	0.009 *(1.43)*	0.011 *(1.96)**	0.028 *(3.58)****	0.027 *(3.70)****	0.014 *(2.24)***	0.017 *(2.57)***
Adj. R^2	0.102	0.055	0.054	0.110	0.143	0.089	0.142
*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10.							

6.7 Summary

This chapter presents the empirical findings regarding the relationship between the effectiveness of the board of directors, the audit committee and auditor quality in constraining earnings management. The effectiveness of the board and the audit committee is measured based on size, composition of independent members, financial expertise and number of meetings. The auditor quality proxies are surrogates by audit fees, NAS fees and industry specialist auditors. Earnings management is measured by the absolute value of the discretionary accruals using the Jones model, the modified Jones model and performance-adjusted discretionary accruals.

The multivariate regression analysis conducted on the sample of 613 firm-year observations suggests that firms paying higher audit fees and employing the industry specialist auditors are less likely to manage earnings. These results are robust to various model specifications, including the 2SLS test. The negative relationship between audit fees and discretionary accruals may suggest that auditor effort, which driven by the audit hours, indirectly minimises opportunistic earnings among managers, due to their concern that such actions may be discovered by the extensive auditor efforts. This argument is consistent with Caramanis and Lennox (2008), who suggest that higher audit hours reduce earnings management.

With respect to the auditor independence measures, there is no evidence support that the NAS fees associates with earnings management. Furthermore, the results for industry specialist auditors are significant only with respect to the portfolio and complementary approaches. Previously, Krishnan (2001) has suggested that the portfolio approach is better suited to capturing the auditors' industry expertise, because some industries which they invest may not be reflected under the market share approach. The complementary approach, however, captures the complementary effect s between both the market share and portfolio approaches (Neal and Riley, 2004).

In contrast to the predictions regarding the effectiveness of the board of directors and audit committee in constraining opportunistic earnings, the present study finds no evidence that the size, composition, financial expertise or number of meetings affect the extent of earnings manipulation. It may be due to the monitoring characteristics of the board and audit committee are offset by the increased auditor quality. The summary of findings is presented in Table 6.13.

Table 6.13: The summary of the hypothesis and the findings – the relationship between the corporate governance characteristics' and auditor quality in constraining earnings management.	
Hypotheses	Findings
H_{24}: *There is a positive relationship between the audit committee's meeting frequency and the engagement of industry specialist auditor*	Not supported
H_{25}: *There is a positive relationship between the board's size and earnings management.*	Not supported
H_{26}: *There is a negative relationship between the independent board and earnings management.*	Not supported
H_{27}: *There is a negative relationship between the board's financial expertise and earnings management.*	Not supported
H_{28}: *There is a negative relationship between the board's meeting frequency and earnings management.*	Not supported
H_{29}: *There is a negative relationship between the audit committee's size and earnings management.*	Not supported
H_{30}: *There is a negative relationship between the solely independent audit committee and earnings management.*	Not supported
H_{31}: *There is a negative relationship between the audit committee's financial expertise and earnings management*	Not supported
H_{32}: *There is a negative relationship between the audit committee's meeting frequency and earnings management.*	Not supported
H_{33}: *There is a negative relationship between audit fees and earnings management.*	Supported
H_{34}: *There is a positive relationship between NAS fees and earnings management.*	Not supported
H_{35}: *There is a negative relationship between industry specialist auditor and earnings management.*	Supported

CHAPTER 7
SUMMARY AND CONCLUSIONS

7.1 Introduction

This final chapter presents the overview, summary and conclusion of the two empirical investigations that have been examined in this thesis. The first investigation looked at the relationship between the characteristics of the board of directors, the audit committee and audit quality, whilst the second examined the relationship of the board, the audit committee and external auditor quality in constraining earnings management. The chapter also details the implications and limitations of the investigations, as well as suggestions for future research.

7.2 Overview, summary and conclusion of the study

Issues relating to audit quality and earnings management have been the focus of many scholarly and regulatory debates all around the world. The board of directors, audit committee and external auditors have been recognised as the mechanisms which, having the ability to monitor opportunistic earnings and thereby directly linked with financial reporting quality, consistent with the agency theory proposition. Unfortunately, previous studies are predominantly US based research where the litigation environment, governance structure and the auditor reputation are perceived to be different, thus limit the generalizability of the findings to other countries. This thesis examines these issues in the context of the UK, based on the FTSE 350 between the fiscal years 2004 and 2008.

Since investors are unable to directly observe audit quality and earnings management, they rely on the board of directors, audit committee and auditors to obtain financial statements that are free from misstatement, error or fraud. Therefore, in this thesis, there are eight corporate governance characteristics and three proxies of auditor quality have been empirically examined. Consistent with agency theory and with prior evidence regarding the effective of certain characteristics of board of directors and audit committee, the present study posits that the board of director with smaller number of members, have more independent non-executive directors, possess financial expertise and have more regular meetings are defined as effective board. Similarly, an audit committee with more members, comprise solely independent directors, have more financial expert and meet frequently is also considered as an effective audit committee. Based on the signalling or reputation hypothesis, audit fees and industry specialist auditor are used as the proxies of audit quality. In addition, the NAS is surrogates for auditor independence that have been viewed with scepticism by the regulators to impair the auditor objectivity while providing the auditing services. Accordingly, higher audit fees (Abbott et al., 2003a; Carcello et al., 2002; O'Sullivan, 2000)[75], lower NAS fees (Wines, 1994; Firth, 2002; Frankel et al. 2002; Raghunandan, 2003; Sharma and Sidhu, 2001; Larcker and Richardson, 2004) and the engagement of industry specialist auditors (Owhoso et al., 2002; Bédard and Biggs, 1991; O'Keefe at al., 1994; Carcello and Nagy, 2004) are viewed as a higher audit quality or higher auditor quality. These characteristics of board and audit committee and auditor quality proxies are expected to signal to market participants how effective a given firm is in monitoring financial reporting, therefore conveying the credibility of the firm's financial statements.

Specifically, there are two empirical associations have been examined in this thesis. First, it examines the association between the effective monitoring characteristics of board and audit committee on audit quality. In particular, three models of audit quality are examined: audit fees, NAS fees and industry specialist auditors. From the audit fees model, the present study finds a positive relationship between audit fees and the independent non-executive directors on board. This result suggests that independent board members demand additional and extensive audit effort from auditors in order to certify their monitoring function, thus increasing audit fees and perceived audit quality. This result is consistent with the findings of Carcello et al. (2002), Abbot et al. (2003a), O'Sullivan (2000) and Adelopo (2010). The other characteristics of the board and audit committee either marginally correlated or insignificantly correlated with audit fees. The present study conjectures that these might be due to the independent board characteristic counteract the other effective characteristics of the board and audit committee. These results are robust to various model specifications and tests.

[75] Despite the proposition that higher audit fees are associated with a higher audit quality, consistent with extensive audit effort and time, the present study is aware of the possibility that lower audit fees could also be associated with higher audit quality. Refer to Chapter 3 for a detailed argument on this.

The results from NAS fees model yield the opposite proposition, suggesting that a higher proportion of independent board is associated with higher NAS fees. This contradicts to the view that independent board use their vigilant oversight function to limit the NAS as they perceive the higher NAS fees impair the auditor independence. It is possible that independent board perceive the joint provision of audit and NAS are not necessarily compromise the auditor independence, but may possibly broaden the auditors' knowledge and improve their audit judgments, resulting in higher audit quality (see Simunic, 1984; Beck et al., 1988a; Arruñada, 1999a; 1999b; 2000; Wallman, 1996; Goldman and Barlev, 1974). However, this result is conditional. It is significant when the levels of NAS *(LNNAF)* and the sum of the total fees *(LNTOTALFEES)* are applied, but no significant evidence is documented when the NAS ratios are used to measure auditor independence. Prior studies suggest that *LNNAF* and *LNTOTALFEES* are the best measures to capture the economic importance of the client to the auditor as compared with NAS fees ratios (Ashbaugh et al., 2003; Larcker and Richadson, 2004). The other corporate governance characteristics provide inconsistent results to be linked with the NAS fees. These results are robust to various model specifications and tests.

In association with the auditor industry specialist model, the evidence suggests inconsistent results between the effectiveness of the board and the audit committee and their engagement of industry specialist auditors in the year-by-by analysis. In the pooled sample, four out of five measures of industry specialist auditors suggest that firms whose audit committee consist solely of independent members and have a lower number of committee meetings during the year are more likely to employ industry specialist auditors. Whilst significant, these relationships are, however, sensitive to the measures of auditor industry expertise and the new variable definition of independence and meeting frequency of audit committee, thus the present study caution against drawing inferences from this finding.

The second investigation carried out by this study examines the roles of board of directors, audit committee and auditor quality in constraining opportunistic earnings. In order to identify the level of opportunistic earnings behaviour and extreme reporting decisions made by the management , the absolute value of discretionary accruals is employed (e.g. Jones 1991; DeFond and Jiambalvo, 1994; Subramanyam

1996; Becker et al., 1998). As in prior studies, the absolute values of discretionary accruals are estimated using the cross-sectional Jones model and the modified Jones model as well as performance-adjusted discretionary accruals. As predicted, and consistent with the prior US studies, the present study finds that firms paying higher audit fees and engaging industry specialist auditors are likely to be associated with lower levels of discretionary accruals, suggesting that a higher quality auditor constrains opportunistic earnings. Firms paying higher audit fees are associated with a higher auditor effort, thereby minimising the management's opportunistic earnings due to their concern that such actions may be discovered by the extensive auditor efforts. This proposition is consistent with the prior evidence documented by Caramanis and Lennox (2008), who suggest a negative relationship between audit hours (proxy for audit effort) and earnings management. These results are robust to various model specifications and tests.

In association with auditor independence, there is no evidence to suggest a relationship between NAS fees and earnings management. This result is contrary to the evidence reported by Ferguson et al. (2004) and Antle et al. (2006), who suggest positive and negative relationships between the NAS and earnings management of UK firms in the periods 1996-1998 and 1994-2000, respectively. This may be due to the reformation of governance practices in the UK resulting from the revision of the UK Corporate Governance Code (2010), which first was introduced in July 2003 and placed major emphasis on the oversight functions of board and audit committees. It may also be explained by developments in NAS studies. Consistent with this, the first empirical evidence documented in this thesis suggests that NAS fees are viewed by independent board members as being able to contribute to a higher quality audit. This may compensate for the monitoring effects of NAS on opportunistic earnings. As a result, there is insignificant relationship between NAS and earnings management.

The results of the industry specialist auditor model seem to be sensitive to auditor industry expertise measures. It suggests a significant relationship with earnings management when auditor industry specialist is measured using the portfolio and complementary approaches, but insignificant relationship when the market share approach is applied. The significant relationship indicates that the industry specialist auditor has a greater ability to constrain opportunistic earnings than the non-specialist auditor.

The results for the characteristics of boards and audit committees suggest no evidence that size, composition, financial expertise and meeting frequency affect the extent of earnings manipulation. Similarly, the results for ownership structure also suggest an insignificant relationship with earnings management. These insignificant relationships may be offset by the monitoring characteristics of a board, audit committee and institutional investors with the increased in auditor quality. Overall, the results may suggest that auditors are more effective in constraining opportunistic earnings than boards of directors, audit committees and institutional investors.

The results on effective characteristics of board and audit committee suggest no evidence the size of committee, composition of independent members, financial expertise and number of committee meeting effect the extent of earnings manipulation in all models. Similarly, the results on the ownership structures also suggest insignificant relationship with earnings management. These insignificant relationships may be offset by the effective monitoring characteristics of board, audit committee and the institutional investor with the increased in auditor quality. Overall, the results may suggest that the auditors are more effective in constraining the opportunistic earnings than the board of director, audit committee and institutional investors.

In relation to audit quality measures, both empirical investigations may suggest that the audit quality surrogates by NAS fees and auditor industry specialist are sensitive to different type of measures. This may support prior claims that the measurements for audit quality are complex and problematic (see, for example, Wooten, 2003; Niemi, 2004; Jensen and Payne, 2005).

Overall, the present study concludes that the findings confirm the proposition of agency theory on independent board characteristic that certify their monitoring function by demanding a higher quality audit from the auditors, and that higher quality auditors have a greater ability to constrain opportunistic earnings than low quality auditor, resulting in the improvement of financial reporting quality. These results are generally consistent with the prior studies in this field (see Cohen et al., 2002; Caramanis and Lennox, 2008).

7.3 Implications of the study

The findings of this thesis should be of potential interest to policy makers, professionals, the boards of directors and academics, especially on issues relating to audit quality and corporate governance practice.

Policy makers may use the findings regarding NAS fees to consider the potential benefits of the joint provision of auditing and NAS. Previously, they claim that NAS compromises the auditor independence and thus banning the several NAS. In relation to governance practice, the policy makers should continuously recognise the important roles played by independent non-executive as one of the fundamental characteristics of corporate governance system in UK since their monitoring effects improved the governance systems of the firms.

The professionals, such as financial analysts, may use the findings to integrate the study on how the market perceived higher audit quality as constraining earnings management effects the capital market decisions. If the market perceived the firms with higher audit fees and audited by the industry specialist auditor are associated with higher financial reporting quality, the reported financial statement may be viewed as more reliable for investment decision and credit assessment.

The study's analysis of corporate governance and audit quality may be of use to boards of directors as a parameter to estimate how the characteristics of board and the choice of auditor may influence financial reporting quality. The findings may help boards of directors to see the positive impact of independent members and higher quality auditors on audit quality and earnings management.

Finally, the study's findings regarding industry specialist auditors may interest academics, particularly with regard to designing industry specialist auditor measures, since industry specialist measures are sensitive to the type of approach taken.

7.4 Limitations of the study

This thesis is subject to several potential limitations. Firstly, the sample for this thesis is drawn from a selection of the larger FTSE 350 UK firms operating in unregulated industries. Thus, the results of the study may not be applicable to firms below the FTSE 350 or to regulated firms, because the internal strength of the firms' governance structures varies according to firm size and industry. However, in general, the findings are in agreement with prior evidence and with agency theory, particularly in relation to the monitoring function of board of directors and of higher quality auditors.

Secondly, the data used in this thesis are from 2005 to 2008, in which 2008 has been considered by the economists as the year of global financial crisis due to the collapse of large financial institutions. There is possibility that the findings may be driven by the changes in the particular year(s) during or before the financial crisis.

Thirdly, it is possible that some variables may be subjected to some measurement error. The accruals measures are criticised due to the likelihood of misclassifying the discretionary and non-discretionary accruals.

Fourthly, the phenomena of earnings management that are indicated in this thesis are related to the opportunistic earnings. Given that the GAAP practice allowed the flexibility of accounting choices, the managers may also use their discretion over earnings to convey the private information, by which could potentially maximise the firm's value. The auditors may underestimate the earnings discretion made by management since the earnings management involved a higher degree of managerial judgement. Therefore, the findings in this thesis are restricted on the assumption of opportunistic earnings rather than the beneficial information.

Fifthly, the audit quality variables may be proxies for something other than is assumed in the underlying construct of the tests. In this thesis, the audit quality measures are driven by the auditor's reputation capital and perceived auditor independence, and thus the results are based on market perceptions (audit quality as perceived by market participants). The use of other audit quality measures such as restatements and auditors' litigation may help to generalise the actual audit quality rather than the perceived audit quality.

Lastly, there is always the possibility that the models employed in this thesis remain a potential for certain omitted variables bias that are correlated both with audit quality and earnings management. However, several steps have been taken to reduce the likelihood of correlated variables, including the tests for additional control variables, endogeneity and fixed or random effects models.

Given these limitations, the findings and implications of the study need to be interpreted with caution.

7.5 Recommendations for future research

There are several ways to extend the studies examined in this thesis. Firstly, as well as financial expertise characteristic, it is argued that strong industry backgrounds increase understanding of the business environment, thus helping to improve the quality of financial reporting. Cohen et al. (2008) argue that audit committee with the strong industry expertise the will have significant business knowledge and highly access to the resources that contribute to superior ability to understand and interpret the business activities and risk. Thus, they able to evaluate whether the firms used theappropriate reporting procedures, make estimation and assumptions that fit accordingly to their business environment. Subsequently these may reflect the true economic value of a given firm, hence enhancing financial reporting quality. Thus, future research should consider whether financial expertise and strong industry background make board of directors and the audit committee more effective.

Secondly, as previously noted in the limitations, the results of this thesis are based on the perceived audit quality measures that driven from the auditors' reputation capital theory. Francis (2004) argues that audit quality can range from low to very high, and that audit failure can be classified as extremely low audit quality (end quality), which includes several forms, such as regulatory sanction, litigation, business failure and earnings restatement. These forms of audit failure are classified as the actual audit quality measures. Therefore, future studies should investigate how the used of actual audit quality measures effect the corporate governance and earnings management could be different compared to the perceived audit quality measures.

Thirdly, the studies on corporate governance and auditor quality in constraining earnings management can be further examined by taking into account the complementary and substituting nature of joint effect of both corporate governance and auditor quality mechanisms. Such research may contribute to the understanding of the behaviour of auditors and corporate governance mechanisms in association to the financial reporting quality.

Lastly, the final suggestion for future research can also consider the importance of corporate voluntary disclosure as a mechanism to limit the opportunistic earnings. Several studies suggest that the high disclosure quality reduce earnings manipulation (Jo and Kim, 2007; Lapointe-Antunes et al. 2006). In addition, Beattie (2005) and Lapointe-Antunes et al. (2006) suggest that the studies of voluntary disclosure and earnings management are not fully being explored. Thus, the research in this area may provide comprehensive studies in earnings management.

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Appendix 1

The prohibitions of the specific non-audit services as outlined in ES 5 (revised) – NAS provided to audited entities

INTERNAL AUDIT SERVICES

44 The audit firm shall not undertake an engagement to provide internal audit services to an audited entity where it is reasonably foreseeable that:

(a) For the purposes of the audit of the financial statements, the auditor would place significant reliance on the internal audit work performed by the audit firm; or

(b) For the purposes of the internal audit services, the audit firm would undertake part of the role of management.

INFORMATION TECHNOLOGY SERVICES

52 The audit firm shall not undertake an engagement to design, provide or implement information technology systems for an audited entity where:

(a) the systems concerned would be important to any significant part of the accounting system or to the production of the financial statements and the auditor would place significant reliance upon them as part of the audit of the financial statements; or

(b) For the purposes of the information technology services, the audit firm would undertake part of the role of management.

VALUATION SERVICES

56 The audit firm shall not undertake an engagement to provide a valuation to:

(a) an audited entity that is a listed company or a significant affiliate of such an entity, where the valuation would have a material effect on the listed company's financial statements, either separately or in aggregate with other valuations provided; or

(b) Any other audited entity, where the valuation would both involve a significant degree of subjective judgment and have a material effect on the financial statements either separately or in aggregate with other valuations provided.

ACTUARIAL VALUATION SERVICES

63 The audit firm shall not undertake an engagement to provide actuarial valuation services to:

(a) An audited entity that is a listed company or a significant affiliate of such an entity, unless the firm is satisfied that the valuation has no material effect on the listed company's financial statements, either separately or in aggregate with other valuations provided; or

(b) any other audited entity, unless the firm is satisfied that either all significant judgments, including the assumptions, are made by informed management or the valuation has no material effect on the financial statements, either separately or in aggregate with other valuations provided.

TAX SERVICES

72 The audit firm shall not promote tax structures or products or undertake an engagement to provide tax advice to an audited entity where the audit engagement partner has, or ought to have, reasonable doubt as to the appropriateness of the related accounting treatment involved, having regard to the requirement for the financial statements to give a true and fair view in accordance with the relevant financial reporting framework.

74 The audit firm shall not undertake an engagement to provide tax services wholly or partly on a contingent fee basis where:
(a) the services are provided to an audited entity and the engagement fees are material to the audit firm or the part of the firm by reference to which the audit engagement partner's profit share is calculated; or
(b) The outcome of those tax services (and, therefore, the amount of the fee) is dependent on:
(i) The application of tax law which is uncertain or has not been established; and
(ii) A future or contemporary audit judgment relating to a material matter in the financial statements of an audited entity.

76 The audit firm shall not undertake an engagement to provide tax services to an audited entity where the engagement would involve the audit firm undertaking a management role.

78 For an audited entity that is a listed company or a significant affiliate of such an entity, the audit firm shall not undertake an engagement to prepare current or deferred tax calculations for the purpose of preparing accounting entries that are material to the relevant financial statements, save where the circumstances contemplated in paragraph 131 apply.

82 The audit firm shall not undertake an engagement to provide tax services to an audited entity where this would involve acting as an advocate for the audited entity, before an appeals tribunal or court5 in the resolution of an issue:
(a) that is material to the financial statements; or
(b) where the outcome of the tax issue is dependent on a future or contemporary audit judgment.

LITIGATION SUPPORT SERVICES

88 The audit firm shall not undertake an engagement to provide litigation support services to:
(a) an audited entity that is a listed company or a significant affiliate of such an entity, where this would involve the estimation by the audit firm of the likely outcome of a pending legal matter that could be material to the amounts to be included or the disclosures to be made in the listed company's financial statements, either separately or in aggregate with other estimates and valuations provided; or
(b) any other audited entity, where this would involve the estimation by the audit firm of the likely outcome of a pending legal matter that could be material to the amounts to be included or the disclosures to be made in the

Consultation on audit firms providing non-audit services to listed companies that they audit financial statements, either separately or in aggregate with other estimates and valuations provided and there is a significant degree of subjectivity involved.

LEGAL SERVICES

91 The audit firm shall not undertake an engagement to provide legal services to an audited entity where this would involve acting as the solicitor formally nominated to represent the audited entity in the resolution of a dispute or litigation which is material to the amounts to be included or the disclosures to be made in the financial statements.

RECRUITMENT AND REMUNERATION SERVICES

93 The audit firm shall not undertake an engagement to provide recruitment services to an audited entity that would involve the firm taking responsibility for the appointment of any director or employee of the audited entity.

95 For an audited entity that is a listed company, the audit firm shall not undertake an engagement to provide recruitment services in relation to a key management position of the audited entity, or a significant affiliate of such an entity.

99 The audit firm shall not undertake an engagement to provide advice on the quantum of the remuneration package or the measurement criteria on which the quantum is calculated, for a director or key management position of an audited entity.

CORPORATE FINANCE SERVICES

109 The audit firm shall not undertake an engagement to provide corporate finance services in respect of an audited entity where:

(a) the engagement would involve the audit firm taking responsibility for dealing in, underwriting or promoting shares; or

(b) the audit engagement partner has, or ought to have, reasonable doubt as to the appropriateness of an accounting treatment that is related to the advice provided, having regard to the requirement for the financial statements to give a true and fair view in accordance with the relevant financial reporting framework; or

(c) such corporate finance services are to be provided on a contingent fee basis and:

  (i) the engagement fees are material to the audit firm or the part of the firm by reference to which the audit engagement partner’s profit share is calculated; or

  (ii) the outcome of those corporate finance services (and, therefore, the amount of the fee) is dependent on a future or contemporary audit judgment relating to a material matter in the financial statements of an audited entity; or

(d) the engagement would involve the audit firm undertaking a management role in the audited entity.

TRANSACTION RELATED SERVICES

119 The audit firm shall not undertake an engagement to provide transaction related services in respect of an audited entity where:

(a) the audit engagement partner has, or ought to have, reasonable doubt as to the appropriateness of an accounting treatment that is related to the advice provided, having regard to the requirement for the financial statements to give a true and fair view in accordance with the relevant financial reporting framework; or

(b) such transaction related services are to be provided on a contingent fee basis and:

  (i) the engagement fees are material to the audit firm or the part of the firm by reference to which the audit engagement partner’s profit share is calculated; or

  (ii) the outcome of those transaction related services (and, therefore, the amount of the fee) is dependent on a future or contemporary audit judgment relating to a material matter in the financial statements of an audited entity; or

(c) the engagement would involve the audit firm undertaking a management role in the audited entity.

ACCOUNTING SERVICES

127 The audit firm shall not undertake an engagement to provide accounting services to:

(a) an audited entity that is a listed company or a significant affiliate of such an entity, save where the circumstances contemplated in paragraph 131 apply; or

(b) any other audited entity, where those accounting services would involve the audit firm undertaking part of the role of management.